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No. 02-682

IN THE

Supreme Court of the United States

VERIZON COMMUNICATIONS INC.,

Petitioner,

v.

LAW OFFICES OF CURTIS V. TRINKO, LLP,

Respondent.

On Writ of Certiorari to the United States Court of Appeals for the Second Circuit

BRIEF OF *AMICI CURIAE* ECONOMICS PROFESSORS IN SUPPORT OF RESPONDENT

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TABLE OF CONTENTS

	Page
TABLE OF AUTHORITIES	ii
INTEREST OF *AMICI CURIAE*	1
SUMMARY OF ARGUMENT	3
ARGUMENT	11
CONCLUSION	26

TABLE OF AUTHORITIES

CASES — Page

Brooke Group Ltd. v. *Brown & Williamson Tobacco Corp.*, 09 U.S. 209 (1993) 14
Eastman Kodak Co. v. *Image Tech. Servs., Inc.*, 504 U.S. 451 (1992) 4
Matsushita Elec. Indus. Co. v. *Zenith Radio Corp.*, 475 U.S. 574 (1986) 14
Otter Tail Power Co. v. *United States*, 410 U.S. 366 (1973) 18
Phonetele, Inc. v. *AT&T Co.*, 664 F.2d 716 (9th Cir. 1981) 25
Standard Oil Co. of N.J. v. *United States*, 221 U.S. 1 (1911) 11
United States v. *Grinnell Corp.*, 384 U.S. 563 (1966) 11
United States v. *Microsoft Corp.*, 253 F.3d 34 (D.C. Cir.), *cert. denied*, 534 U.S. 952 (2001) ... 12
Verizon Communications, Inc. v. *FCC*, 535 U.S. 467 (2002) 10, 17, 21, 22, 25
Walker Process Equip., Inc. v. *Food Mach. & Chem. Corp.*, 382 U.S. 172 (1965) 18

STATUTE

Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 25

ADMINISTRATIVE DECISION

Implementation of the Local Competition Provisions of the Telecomms. Act of 1996, 15 FCC Rcd. 3696 (1999) 22

SCHOLARLY AUTHORITIES

Phillip Areeda, *Essential Facilities*, 58 Antitrust L.J. 841 (1990) 20

TABLE OF AUTHORITIES – continued

Page

William J. Baumol, *The Free-Market Innovation Machine* (2002) 16
William J. Baumol, *Predation and the Logic of the Average Variable Cost Test*, 39 J.L. & Econ. 49 (1996) 13
William J. Baumol & Janusz A. Ordover, *Use of Antitrust to Subvert Competition*, 28 J.L. & Econ. 247 (1985) 13
William J. Baumol & J. Gregory Sidak, *Toward Competition in Local Telephony* (1994) 15
William J. Baumol et al., *Contestable Markets and Industry Structure* (1982) 14
Robert H. Bork, *The Antitrust Paradox* (1978) 16
Stephen Breyer, *Regulation and Its Reform* (1982) 19
Dennis W. Carlton & Jeffrey M. Perloff, *Modern Industrial Organization* (3d ed. 2000) 14
1 Alfred Kahn, *The Economics of Regulation* (1970) 19
Joseph D. Kearney & Thomas W. Merrill, *The Great Transformation of Regulated Industries Law*, 98 Colum. L. Rev. 1323 (1998) 19
Jean-Jacques Laffont & Jean Tirole, *Competition in Telecommunications* (2000) 15
Janusz A. Ordover & Robert D. Willig, *An Economic Definition of Predation: Pricing and Product Innovation*, 91 Yale L.J. 8 (1981) ..... *passim*
Janusz A. Ordover & Robert D. Willig, *Access and Bundling in High-Technology Markets, in Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace* (Eisenach & Lenard eds., 1999) 13

TABLE OF AUTHORITIES – continued

Page

Janusz A. Ordover et al., *Nonprice Anticompetitive Behavior by Dominant Firms toward Producers of Complementary Products, in Antitrust and Regulation* (F. Fisher ed., 1985) ... 12

Janusz A. Ordover et al., *Predatory Systems Rivalry: A Reply*, 83 Colum. L. Rev. 1150 (1983) ... 12

Robert D. Willig, *The Theory of Network Access Pricing, in Issues in Public Utility Regulation* (Trebing ed., 1979) ... 15

OTHER AUTHORITIES

1 ABA Section on Antitrust, *Antitrust Law Developments* (5th ed. 2002) ... 18

INTEREST OF *AMICI CURIAE*[1]

Amici curiae are economics scholars.

William J. Baumol is Professor of Economics at New York University and Professor Emeritus and Senior Research Economist at Princeton University. He has taught advanced courses on industrial economics and the economics of antitrust issues and written a number of books and articles on this and related topics.

Janusz A. Ordover is Professor of Economics at New York University. Professor Ordover was Deputy Assistant Attorney General for Economics in the Antitrust Division of the United States Department of Justice ("DOJ") from 1991 to 1992. He has taught advanced courses on industrial economics and the economics of antitrust issues and written a number of articles on this and related topics.

Frederick R. Warren-Boulton is a Principal in Microeconomic Consulting & Research Associates, Inc. Dr. Warren-Boulton was Deputy Assistant Attorney General for Economics in the Antitrust Division of the DOJ from 1985 to 1989 and Director of the DOJ's Economic Policy Office from 1983 to 1985. Dr. Warren-Boulton served as an expert witness on behalf of the DOJ in its antitrust lawsuits against both the Bell System and Microsoft.

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[1] Pursuant to Rule 37.6 of the Rules of this Court, *Amici* state that no counsel for a party or any other entity authored this brief in whole or in part, and no person or entity other than *Amici* and their counsel made any monetary contribution to the preparation or submission of this brief. Pursuant to Rule 37.3, *Amici* state that the parties have granted blanket consent to the filing of briefs by *Amici* supporting either party.

Robert D. Willig is Professor of Economics and Public Affairs at the Woodrow Wilson School and the Economics Department of Princeton University. Professor Willig was Deputy Assistant Attorney General for Economics in the Antitrust Division of the DOJ from 1989 to 1991. He has taught advanced courses on industrial economics and the economics of antitrust issues and written a number of articles on this and related topics.

The qualifications of *Amici*, the positions that they hold and have held, and the scholarly honors and distinctions that they have earned, are listed in greater detail in Appendix A to this brief.

Amici have a strong interest in this case. They have written extensively about industrial organization, the field of economics that is concerned with competition among business firms and upon which "antitrust economics" is founded. In particular, *Amici* have, in scholarly articles and in submissions to courts, written widely on the proper economic analysis to apply to business conduct that is challenged as predatory or exclusionary behavior that constitutes "willful" monopolization under section 2 of the Sherman Act. Professors Ordover and Willig are widely credited with developing the "sacrifice" test that was also independently formulated and applied about the same time by Professor Baumol in assessing claims that conduct challenged as exclusionary, in fact, reflected "legitimate business practices." This is the criterion the Department of Justice and Federal Trade Commission (collectively "the Government") urge the Court to adopt as an absolute prerequisite for a finding that a refusal to deal, whatever the particular market or regulatory conditions, amounts to "willful acquisition or maintenance" of monopoly power.

The purpose of this submission is to show that the sacrifice test for assessing claims that business practices are exclusionary, while a powerful analytic weapon in helping to

determine whether some course of conduct is or is not anticompetitive, is not always definitive, as the Government maintains. Depending on the issue and the pertinent circumstances, a course of conduct that passes this test may nevertheless be anticompetitive and consequently in violation of the antitrust laws. In circumstances, such as those at issue here, where a presumption can be established that passage of the test fails to demonstrate conclusively and automatically that the conduct at issue was not anticompetitive, then only by consideration and evaluation of material issues of fact at a trial can one legitimately determine whether the actions at issue are or are not willfully anticompetitive. At issue here is a particular and important instance in which undertakings that pass the sacrifice test and therefore may appear to be legitimate business acts, nevertheless may not be so and may well be in violation of the antitrust laws. That is because the acts at issue are alleged to contravene what a qualified governmental agency has determined to be a requirement of law for the purpose of fostering effective competition in the relevant market. It must be recognized that actions that flout such regulatory decisions may plausibly constitute a willful measure undertaken to attain or preserve monopoly power in the market, and that the validity of this conclusion can only be tested with the aid of the pertinent facts.

SUMMARY OF ARGUMENT

The courts and legal and economic scholars have long struggled to formulate economically defensible and judicially workable standards for determining whether business conduct that has been attacked under the antitrust laws is predatory or exclusionary. This is a vexing problem, because of the close resemblance between vigorous competitive activities that the law appropriately is designed to encourage in order to promote the public interest, and activities that are anticompetitive and hence damaging to the public welfare. The difficulty of distinguishing these two types of behavior

stems from the fact that they both are disadvantageous to rivals. A firm would always be better off if the vigor of a rival's legitimate competitive efforts were to diminish, but this is also true of predatory or exclusionary conduct. Added to this is the analytic difficulty resulting from the myriad forms that business conduct can take, and the fact that conduct that is anticompetitive in one context may be procompetitive in another. See *Eastman Kodak Co.* v. *Image Tech. Servs., Inc.*, 504 U.S. 451, 488 (1992) (Scalia, J., dissenting) (citing 3 P. Areeda & D. Turner, *Antitrust Law* ¶ 813, at 300-02 (1978)). The challenge for antitrust courts is, and always has been, to apply standards that deter anticompetitive behavior without undermining incentives for procompetitive pricing, production, investment and innovation (and without unduly taxing scarce judicial resources). As in all such complex endeavors, scholars and decision-makers search (usually in vain) for the simple, unified standard that can be employed to reach the right result in every case. Unfortunately, there is, as yet, no such universal economic litmus test for the identification of anticompetitive business conduct in all circumstances.

Amici are, however, in broad agreement with the Government that "sacrifice" – *i.e.*, a choice of a business strategy that would be contrary to interest or unprofitable to the firm that undertakes it without the additional monopoly power resulting from the exit or disabling of rivals it is likely to cause – is a powerful tool that can help materially in assessment of claims that some business conduct violates section 2 of the Sherman Act. Where, for example, a court can be confident, on the basis of the evidence, that the challenged conduct entails such sacrifice, the conduct generally should be presumed to be predatory or exclusionary (and if the plaintiff has met its burden of proving the other elements of monopolization, a violation of section 2). As *Amici* Professors Ordover and Willig demonstrated in their 1981 Yale Law Journal article that first provided specific

sacrifice-based tests to distinguish between predatory and procompetitive conduct, a business practice that *only* makes sense because it causes rivals to exit or to lose their competitive force, and thereby significantly increases the firm's power over price is almost certainly anticompetitive, harmful to consumers, and hence does not constitute a legitimate business practice. This is so because the finding that the practice would not make business sense absent the additional monopoly power it provides generally reveals that the business practice is antitcompetitive, and would not be undertaken by a rational firm management unless it can be expected to reduce competition in the market. In economic terms, the consequences must be economic inefficiency, for the action must generate more in economic costs than in consumer benefits and lawful concomitant business benefits. In sum, the practice could be presumed to diminish social welfare by lessening competition and by increasing monopoly power. See Janusz A. Ordover & Robert D. Willig, *An Economic Definition of Predation: Pricing and Product Innovation*, 91 Yale L.J. 8, 9-10 (1981) (hereinafter "Ordover & Willig, *Economic Predation*").

Amici likewise agree with the Government that conduct that does not involve sacrifice should not, *in most cases*, be condemned as exclusionary or predatory. In this regard, the underpinning of the sacrifice test is the common sense notion that the antitrust laws should not penalize profit-driven behavior undertaken in the ordinary course of business, because such conduct is presumptively – although not always – legitimate business conduct without antitcompetitive consequences. That understanding, combined with the practical difficulties courts necessarily encounter in determining when profit-driven behavior is anticompetitive, together with the potential exploitation of such difficulties by less efficient rivals seeking to accomplish with litigation what their inefficiency made impossible in the market, should

engender skepticism towards claims of willful acquisition or maintenance of monopoly power in the absence of sacrifice.

After all, the absence of sacrifice usually indicates that the conduct is profitable for ordinary business reasons. Of course, such conduct may sometimes endanger the viability of a rival by offering consumers attractive prices based on low costs or innovative service or product designs that leave a less capable rival with insufficient demand to remain in the market and exercise full competitive vigor. Although such conduct may cause the rival to exit, and therefore even result in additional monopoly power, the conduct offers direct benefit to consumers, and is the kind of conduct that is characteristic of socially beneficial competition.

Moreover, there are generally – but not always – dangers to the competitive process that result from use of antitrust laws to attack conduct that is characteristic of competition, even where that conduct has had the incidental effect of enhancing monopoly power. It is these dangers that are generally controlled by the sacrifice test for willfulness, with the *proviso* that the prospect of the additional monopoly power must be shown to have been necessary for the conduct to have been in the business interest of the firm accused of monopolization.

The "not always" qualification is, however, a very important one, because there undeniably are circumstances where business conduct can be damaging to the public welfare even though it passes the sacrifice test. In particular, and especially relevant here, there are cases in which such conduct can be shown to be anticompetitive despite the apparently contrary indication of the sacrifice test. This possibility is evidently present where the conduct in question is characterized as an unlawful impediment to competition by regulations promulgated by an appropriate government agency.

Amici therefore part ways with the Government in its attempt to give the sacrifice test a broader role than it can legitimately bear. In particular, *Amici* strongly disagree with the Government's suggestion that it would make sound economic and public policy sense for the Court to mandate strict application of the sacrifice test in all cases challenging a monopolist's refusal to deal with a potential rival, regardless of the context of constraints and regulations bearing on the firm's marketplace conduct. The Government suggests that the Court should grant, regardless of context, a *conclusive*, across-the-board presumption of legitimacy to entry-deterring or exit-inducing business conduct whenever the defendant's existing profits exceed the profits the defendant would earn if it did not refuse to deal with rivals. That would be a serious misapplication of the sacrifice test and, if adopted, could have far-ranging and detrimental consequences for consumers in particular and for competition more generally.

As noted, the sacrifice test is intended to protect ordinary business conduct, even that of an alleged monopolist, because profit-driven conduct by firms (apart from conduct that is only profit-maximizing because it harms competition) can, in most circumstances, be expected to promote overall social welfare. But where Congress, an administrative agency or a state government has declared certain conduct to be *unlawful*, that determination cannot simply be disregarded for antitrust purposes. Where a firm violates a legal requirement, even if it is thereby seeking to enhance profits in a manner that does not depend on the exit of competitors, the rationale that underlies the sacrifice test – that such behavior is not anticompetitive and is conducive to the public welfare – evaporates.

It is easy to show that even outside the antitrust context it may be possible for an act to promise long-run profitability without driving out rivals or preventing entry, and yet for that act not to constitute a legitimate business practice. That is,

such an act, despite passing the sacrifice test, may be damaging to economic efficiency and the general welfare. The following hypothetical example makes this clear:

> Firm A, along with other firms, supplies product X, a popular junk food that causes cancer 20 years after protracted consumption. Firm A knows this but engages in false advertising that conceals that danger and claims, convincingly, but falsely, that X actually has beneficial health effects. The false claim greatly increases market demand, benefiting Firm A, along with all of its competitors and even leads to entry. Total profit of each incumbent increases, though price is driven down closer to pertinent costs. Clearly, profits have risen and competitiveness has also increased, but consumer welfare has been damaged. This is presumably illegal and fraudulent behavior (in terms of false advertising, for example), though it is not an antitrust matter. Damage to consumer welfare is the right criterion for rejection of such an act as a legitimate business practice, but the practice may not by itself constitute an antitrust violation.

But similar problems can also beset the use of the sacrifice test for conduct like that at issue in the case at hand. Such conduct can pass the sacrifice test and yet entail business behavior that is not only illegitimate but that is also anticompetitive. In some markets, regulators have mandated that incumbents provide rivals access to their facilities in order to facilitate competition that would otherwise be unlikely to develop because the incumbents control natural monopoly facilities that cannot be economically duplicated by rivals. Even if denial of, or erection of barriers to, such access may not literally destroy any competitors and yet add to the local carrier's long term profits, such conduct has two features that make it critically relevant to antitrust litigation.

First, the erection of handicaps to access to incumbent facilities impedes achievement of the arrangements that have been mandated by the pertinent authorities as a step unavoidably required in order to introduce effective competitiveness into the arena. Second, even if such barriers to access drive no firm from the market, they may achieve their promised profitability to the incumbent firms if the barriers significantly impede the ability of potential rivals to compete. Thus the acts at issue require at least reexamination of the facts to determine whether (a) they were illegitimate business practice, and (b) they are anticompetitive as well, even if they do not literally destroy any rivals.

The conclusion that follows is that where the extrinsic legal requirements that have been violated are specifically intended to promote competition and prevent the exercise of market power, there can be no plausible implication that the profit-driven conduct is in the public interest. In such circumstances, the general presumption in favor of conduct motivated by the ordinary pursuit of profits (apart from those resulting from additional monopoly power) has been expressly disavowed by the legal requirements. This is common in industries that are subject to regulation because they frequently are characterized by natural monopoly contributed by the indivisible character of the requisite infrastructure. It is a valid conclusion of economics that explicit regulatory rules are appropriate as a means to constrain and suitably modify the incentives for the pursuit of profits in such industries.

Here, absolute reliance on the sacrifice test of willfulness as an indicator of the legitimacy of a particular business practice makes no sense, because there can be no automatic presumption that the ordinary pursuit of profits is consistent with the maintenance or promotion of competitiveness and social welfare. Indeed, where irrespective of the outcome of the sacrifice test, a monopolist flouts regulatory requirements

expressly designed to enable competition, this should be considered direct and powerful evidence of "willful" conduct that is not deserving of protection under the antitrust laws. Accordingly, in such circumstances, profit sacrifice cannot, consistently with valid economics, be the *sole* test for willfulness. Rather, in such circumstances, antitrust plaintiffs should, as a matter of antitrust economics, be provided an opportunity to prove that the monopolist's behavior, although seemingly consistent with the pursuit of legitimate profit objectives, is nonetheless anticompetitive and a source of economic inefficiency.

Amici do not mean to suggest that antitrust courts should, even where regulatory requirements have been flouted, lightly or uncritically accept allegations that profit-driven behavior reflects the willful acquisition or maintenance of monopoly power. To the contrary, a fair dose of skepticism (both at the summary judgment stage and later) seems to us appropriate even in this context. And the defendant, like all section 2 defendants, should retain the opportunity to prove substantial and legitimate business justifications for its refusal to deal (apart from the sacrifice test-based justification that the conduct must be *presumed* legitimate merely because it is profit-driven). But the Government's proposed rule, which would in all cases bar plaintiffs from even *attempting* to demonstrate that the challenged profit-driven behavior constitutes the willful acquisition or maintenance of monopoly power, can shield undeniably willful anticompetitive conduct from the reach of the antitrust laws.

For these reasons, dismissal of Respondent's section 2 claim on the ground that Respondent failed sufficiently to allege sacrifice would clearly be inappropriate. It is well recognized that local telephone facilities and services are monopolized by incumbent telephone carriers such as Verizon and that, despite regulation, prevailing retail rates are often supracompetitive. In the Telecommunications Act of

1996, Congress attempted to open these closed local markets to competition. Congress recognized, however, that the incumbents control bottleneck facilities that are essential to competition and can therefore profitably maintain monopoly prices without attracting entry, even if such entry were permitted. That is why Congress mandated that incumbent local exchange carriers provide competitors with access to their last mile facilities on regulated terms and conditions. *Verizon Communications, Inc.* v. *FCC*, 535 U.S. 467, 477-91 (2002). Here, then, there can be no economically justifiable presumption for condoning a refusal to deal by Verizon solely because access would lower profits relative to the profits Verizon earns by refusing to deal. In this context, there can be no legitimate presumption that the refusal to deal is pro-competitive or that intervention that affects unilateral firm conduct would, over a wide range of cases, in any way impede vigorous competition.

In sum, in cases such as this one there is simply no valid economic justification for limiting the "willfulness" inquiry to the investigation of profit sacrifice. On the contrary, unduly strict application of the sacrifice test, as urged by the Government, would immunize from antitrust scrutiny behavior that, while arguably (but not yet demonstrated by Verizon to be) profit-driven for the monopolist, has been deemed by Congress to be – and is – anticompetitive and harmful to consumers. Accordingly, Respondent should be permitted to proceed to discovery and given a chance to prove with direct and objective evidence the allegations in the Complaint that Verizon has engaged in "willful" monopoly maintenance.

ARGUMENT

The Government urges the Court to use this case to establish a new, strict standard for determining whether a regulated monopolist that refuses to deal with a rival has engaged in conduct that violates section 2 of the Sherman

Act. Although section 2 does not prohibit "monopoly in the concrete," *Standard Oil Co. of N.J.* v. *United States*, 221 U.S. 1, 62 (1911), it does condemn "monopolization." Monopolization has two elements: "(1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." *United States* v. *Grinnell Corp.*, 384 U.S. 563, 570-71 (1966).

Determining whether conduct amounts to the "willful acquisition or maintenance" of monopoly power is often quite difficult. As the D.C. Circuit recently observed:

> [w]hether any particular act of a monopolist is exclusionary, rather than merely a form of vigorous competition, can be difficult to discern: the means of illicit exclusion, like the means of legitimate competition, are myriad. The challenge for an antitrust court lies in the stating a general rule for distinguishing between exclusionary acts, which reduce social welfare, and competitive acts, which increase it.

United States v. *Microsoft Corp.*, 253 F.3d 34, 58 (D.C. Cir.) (en banc), *cert. denied*, 534 U.S. 952 (2001).

The Government endorses a "sacrifice" test for determining whether conduct should be considered "willful," – *i.e.*, aimed at acquisition or preservation of monopoly power. The Government explains that "conduct is not exclusionary or predatory *unless* it would make no economic sense for the defendant but for its tendency to eliminate or lessen competition." Gov't Br. at 15. From this perspective, then, "sacrifice" entails a choice of a business strategy that would make no business sense outside of the probability that the conduct would create or maintain monopoly power. *Id.* (conduct is "willful" within the meaning of section 2 when it

is not profitable "but for its tendency to eliminate or lessen competition").

Although the Government does not cite the scholarship of *Amici*, the test that it advances was developed in a series of articles *Amici* published over the past two decades.[2] Most notably, in their often-cited 1981 Yale Law Journal article, Professors Ordover and Willig posited that "predatory behavior is a response to a rival that sacrifices part of the profit that could be earned under competitive circumstances, were the rival to remain viable, in order to induce exit and gain consequent additional monopoly profits." Ordover & Willig, *Economic Predation* at 9-10 (footnotes omitted).

Amici have no quarrel with the Government that the sacrifice test is a powerful tool for assessing willfulness. *Amici* also agree with the Government that, in many market circumstances, the sacrifice test of willfulness is generally, but not always, conducive to economic efficiency. Ordinarily, so long as the conduct in question makes business sense apart from any impact on competition, profit-seeking behavior by individual firms ought to be protected from intrusive, costly, and unpredictable scrutiny by the courts in response to complaints by rivals who may latch on to antitrust

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[2] *See generally* Ordover & Willig, *Economic Predation*; Janusz A. Ordover et al., *Predatory Systems Rivalry: A Reply*, 83 Colum. L. Rev. 1150 (1983); Janusz A. Ordover et al., *Nonprice Anticompetitive Behavior by Dominant Firms toward Producers of Complementary Products, in Antitrust and Regulation* 115-30 (F. Fisher ed., 1985); William J. Baumol, *Predation and the Logic of the Average Variable Cost Test*, 39 J.L. & Econ. 49 (1996); Janusz A. Ordover & Robert D. Willig, *Access and Bundling in High-Technology Markets, in Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace* 103-28 (Eisenach and Lenard eds., 1999).

as a means of subverting competition.[3] Unimpeded pursuit of profits – when constrained by effective present (or future) competition – will usually lead a firm to innovate and to offer consumers products they desire at attractive prices and is thus a pro-competitive means of gaining and maintaining market position. This is generally so even if the result of such activity is exit or reduction in the competitive prowess of other firms. However, when it is the latter effects, and the attendant diminution in competition, that is the only objective explanation for the firm's choice of market behavior, such unimpeded pursuit of profits cannot be considered conducive to overall consumer welfare.

As the Government recognizes, Gov't Br. at 16, the presumption that profit-driven behavior is pro-competitive has been utilized most widely in the context of so-called "predatory pricing." Low prices, of course, can ordinarily be expected to benefit consumers significantly and the courts are understandably reluctant to impose antitrust liability for price reductions lest they "chill the very conduct that antitrust laws are designed to protect." *Matsushita Elec. Indus. Co.* v. *Zenith Radio Corp.*, 475 U.S. 574, 594 (1986). This Court in *Brooke Group Ltd.* v. *Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 224 (1993), held that a plaintiff can prevail on an allegation that a defendant has engaged in predatory pricing only if it can show that the defendant's prices represent a short-term sacrifice intended to gain long-term monopoly profits. *Brooke* therefore establishes that, in the predatory pricing context, conduct should be considered exclusionary only where there is clear evidence of sacrifice accompanied by equally clear evidence that the market is

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[3] *See* William J. Baumol & Janusz A. Ordover, *Use of Antitrust to Subvert Competition*, 28 J.L. & Econ. 247 (1985).

susceptible to monopolization (which underlies the "recoupment" element of the predation test).

Under ordinary market circumstances, sacrifice can also provide pertinent information to the willfulness inquiry in cases involving allegations of refusals to deal or refusals to provide access to "essential facilities."[4] *Amici* agree with the Government that, as a matter of economics, the duty of a business – even of a business with monopoly power – to deal with rivals should be circumscribed. *Amici* likewise agree that where exclusionary conduct that contributes significant monopoly power is shown to entail sacrifice, a duty to deal generally should be implied. Here, a profit-maximizing monopolist would plainly be engaged in sacrifice if it refused to provide access to a needed facility at prices that yield a defensible margin above both the incremental cost of providing access (*i.e.*, the value of the inputs consumed in the process) and the properly assessed "opportunity cost" that the monopolist incurs when a competitor (rather than the monopolist itself) uses the input to provide service.[5]

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[4] *Amici* use the term "essential facility" here to mean facilities that have strong natural monopoly characteristics and cannot be economically duplicated even where the incumbent were to charge an unconstrained monopoly price for access to the essential facility. William J. Baumol et al., *Contestable Markets and Industry Structure* 290-303 (1982); Dennis W. Carlton & Jeffrey M. Perloff, *Modern Industrial Organization* 634 (3d ed. 2000).

[5] *See, e.g.*, Robert D. Willig, *The Theory of Network Access Pricing, in Issues in Public Utility Regulation* 109-52 (Trebing ed., 1979); Ordover & Willig, *Economic Predation*; William J. Baumol & J. Gregory Sidak, *Toward Competition in Local Telephony* 93-116 (1994); Jean Jacques Laffont & Jean Tirole, *Competition In Telecommunications* 97-178 (2000).

It does *not* follow, however, that willful exclusionary conduct occurs *only* when there is such a sacrifice of the sort described above. *Amici* strongly disagree with the Government's request that the Court adopt the sacrifice test as the *sole* basis for determining willfulness in all section 2 refusal-to-deal cases. See, *e.g.*, Govt. Br. at 17 ("a refusal to aid rivals that makes economic or business sense *apart* from a tendency to impair competition is not exclusionary"). If adopted, the Government's test could immunize from antitrust scrutiny a wide range of conduct that can only be viewed as reducing overall consumer welfare.

To understand why this is so, it is essential to consider the analytical underpinnings of the sacrifice test. In their writings, *Amici* have made clear that the sacrifice test is designed to protect business conduct undertaken in the ordinary course that is motivated by pursuit of long-run profits, because such conduct presumptively – *but not necessarily* – promotes overall social welfare. As already discussed, under ordinary market circumstances, the presumption is a powerful one. Market behavior, driven by the profit motive (apart from the profits resulting from additional monopoly power), generally does produce socially desirable outcomes. And, given endemic limitations of information, courts are as likely to do harm (by unintentionally deterring procompetitive conduct) as good (deterring anticompetitive conduct) in attempts to draw lines other than those suggested by the sacrifice test. See *generally* William J. Baumol, *The Free-Market Innovation Machine* (2002); Robert H. Bork, *The Antitrust Paradox* (1978). But there are exceptions – in particular, where constraints and regulations in addition to the market influences of the pursuit of profits shape business behavior – and, for that reason, there possibly exist reliable objective evidence of willfulness even in the absence of demonstrated sacrifice. For these reasons, the sacrifice test was never intended to be *the* sole test for willfulness in this type of economic setting, see, *e.g.*, Ordover

& Willig, *Economic Predation* at 9-10 & n.8, although alternative evidentiary tests should also focus on objective analyses of market conduct and eschew interpretation of the articulations of business personnel.

As explained in greater detail below, a local telephone monopolist's refusal to deal with a potential rival provides a clear example of the limits of the power of the "sacrifice" test. Strict application of the sacrifice test would gauge the profitability of the examined conduct against the benchmark of existing price and industry structures: interpreted in this way, the local telephone monopolist does not incur a "sacrifice" by refusing to grant a competitor wholesale access to its network if the price offered by the rival generates less profits to the monopolist than selling to the rival's prospective customers at retail (and excluding the rival). The sacrifice test's illuminative power rests legitimately on the presumption that in *ordinary* market conditions, profit-driven conduct that merely preserves existing market pricing structures is unobjectionable. In contrast, where, as in the local telephone context, the base-level pricing structures and refusals to deal have been explicitly *repudiated* as anticompetitive by legislation designed to foster competition, such a presumption is plainly inappropriate.

It is also important to recognize that in the special context in which competition-forcing regulatory requirements have been breached, there is far less concern that the antitrust court will erroneously condemn conduct that is unambiguously pro-competitive (or that less efficient rivals will be able to subvert the antitrust laws to further their own business objectives). That is because a defendant will have breached the regulatory requirement (and thereby lost the advantage of the presumption that any profit-driven refusal to deal is pro-competitive) *only* if the defendant refuses to deal at a price that has already been determined by regulators (and this Court as well, in the case of the rules that govern the pricing of

access to local telephone facilities) to be compensatory and competition-enhancing. See *Verizon Communications, Inc.* v. *FCC*, 535 U.S. 467 (2002).

Put more broadly, where Congress has held certain behavior to be unlawful, it can no longer be presumed that such behavior, simply because it would be deemed perfectly lawful, *i.e.*, free of "sacrifice," in another market setting, is economically efficient in the context at issue, irrespective of the likelihood that it will reduce or eliminate competition. On the contrary, where conduct violates a law, even one extrinsic to the antitrust laws, this suggests that there has been an express legislative determination that the conduct affirmatively harms consumer welfare and should not be shielded from antitrust scrutiny. At a minimum, when a firm engages in profit driven, but illegal conduct, the ordinary presumption that the firm's behavior is promoting the social welfare can no longer be maintained.

This common sense (and economically unassailable) notion is well established in antitrust jurisprudence. "[W]here conduct contributes to establishing or maintaining monopoly power, a court will be especially likely to find that conduct predatory or anticompetitive if it is also improper for reasons extrinsic to the antitrust laws." 1 ABA Section on Antitrust, *Antitrust Law Developments* 249 (5th ed. 2002). Indeed, this Court has repeatedly applied this principle to condemn conduct that would otherwise not appear to constitute "sacrifice" within the Government's strict definition of the term. See, *e.g.*, *Otter Tail Power Co.* v. *United States*, 410 U.S. 366, 377-79 (1973) (upholding district court's finding that Otter Tail had acted willfully when, in violation of applicable regulatory requirements, it refused to "wheel" (at wholesale) power for municipalities that were attempting to compete with Otter Tail in retail markets); *Walker Process Equip., Inc.* v. *Food Mach. & Chem. Corp.*, 382 U.S. 172, 173 (1965) (holding that "maintenance and enforcement of a

patent obtained by fraud . . . . may be the basis of an action under § 2 of the Sherman Act"). Although the Government states without explanation that this body of case law is "not implicated here," Gov't Br. at 12 n.3, it is, for the reasons described above, highly relevant to any reasoned section 2 analysis.

As a matter of logic, it is implausible that an antitrust court can rationally assess whether conduct makes "business sense" *without* reference to the legal context of that conduct. Conduct that might make business sense under a particular legal and regulatory regime might not under another set of requirements. Returning to an earlier example, absent legal constraints on fraud or false advertising, it may be "profit maximizing" for a business to misrepresent to consumers the quality of its services even apart from any impact those misrepresentations may have on overall competition. But where such representations can subject the firm to substantial civil penalties or other legal sanctions, such conduct is unlikely to make "business sense" in any meaningful interpretation of that concept.[6]

And where, as here, the extrinsic law in question is one that is specifically intended affirmatively to *promote* competition in natural monopoly industries,[7] the "willfulness" test must

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[6] In this regard, *Amici* note that Respondent has alleged that Verizon's refusal to deal was not supported by a legitimate business justification because Verizon incurred millions of dollars in fines as a result. *See* Amended Complaint ¶ 22.

[7] Specifically, the traditional response by regulators to the problem of natural monopoly industries was to grant them exclusive franchises while regulating the rates that they could charge for their services. *See, e.g.*, Stephen Breyer, *Regulation And Its Reform* 15-19 (1982); 1 Alfred Kahn, *The Economics of Regulation* 11-12 (1970). In this way, regulators sought

reflect this explicit repudiation of what otherwise might be a legitimate profit-maximizing monopoly conduct. Plainly, this overarching public interest is not captured in a test of profit sacrifice that is based on the regulated monopolist's current market position and profit levels. Where Congress explicitly forbids conduct on the grounds that it would prevent the very competition that Congress is affirmatively seeking to foster, there is no rational basis to presume (as the sacrifice test properly does in other contexts) that the current level of profit constitutes the appropriate benchmark with which to evaluate the incumbent's strategy for granting access. In other words, in regulated industries, inflexible utilization of a "sacrifice" test – at least as measured against a benchmark of monopoly profits resulting from flouting regulations designed to foster competition – is invalid as a matter of economics, because there can be no legitimate presumption that such unimpeded pursuit of profits is not anticompetitive and serves the public interest. Conversely, conduct that does not seem to entail a voluntary sacrifice may nevertheless constitute willful monopolization because the firm's conduct choices are

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to avoid potentially "wasteful" competition, while protecting consumers from monopoly rates. Increasingly, however, Congress and state governments have become dissatisfied with this traditional approach. As an alternative, they have sought to use regulation as a means of fostering *competition* that can protect consumer welfare and prevent the monopoly prices that would result from allowing the incumbent firms to engage in pure profit maximization. *See* Joseph D. Kearney & Thomas W. Merrill, *The Great Transformation of Regulated Industries Law*, 98 Colum. L. Rev. 1323 (1998). Recognizing that incumbents that control natural monopoly facilities would have strong incentives to resist providing competitors access to those facilities on terms that could undercut monopoly profits, regulators have required incumbent monopolists to grant competitors "access" to their "'bottleneck'" facilities at regulated rates, terms and conditions. *Id.* at 1326.

inconsistent with regulations that have been expressly found necessary for protection of the public interest.[8]

In addition, where there is direct economic regulation of natural monopoly industries, the usual concern that antitrust courts will erroneously condemn pro-competitive conduct are substantially contained. In such cases, the terms and conditions of the access that are necessary to induce the desired competition, while protecting the legitimate interests of the incumbent, will already have been determined by the expert regulator and so the antitrust court need not arrive on its own at a view of the "optimal" terms for procompetitive access. See Phillip Areeda, *Essential Facilities*, 58 Antitrust L.J. 841, 853 (1990) (antitrust remedies appropriate when "as in *Otter Tail*, a regulatory agency already exists to control the terms of dealing"). In short, where the terms of access are regulated by an expert agency, the risks of misapplication of the antitrust laws are greatly diminished.

The Government misses these critical points in stating that a deviation from a rule that ordinarily does not make actionable the "monopolist's refusal to sell his goods or services below the monopoly price" would be improper because "the contrary rule would not merely require the monopolist to share its facility[,] [i]t would, in effect require the monopolist to share its profits." Gov't Br. at 23. The activities of Verizon at issue here are alleged to violate provisions of the Telecommunications Act of 1996 that were patently adopted to open to competition the monopoly local

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[8] Put another way, the appropriate benchmark for assessment of sacrifice in this context is not the existing pricing scheme that has been explicitly repudiated but the market prices that would have been established under competitive circumstances, but which, of course, have never developed.

telephone markets such as those of Verizon. Congress recognized that incumbent local telephone carriers' control of bottleneck local facilities provided them with an "almost insurmountable competitive advantage" over potential competitors and, in order to make effective competition possible and to enhance public welfare, *Verizon*, 535 U.S. at 490, Congress required incumbent carriers to deal with competitors on regulated terms and conditions, *id.* at 476-77 & 510 n.27 (the 1996 Act makes local competition "an end in itself" and gives "hundreds" of small entrants the ability to use "costly to duplicate" facilities). Undeviating adherence to the sacrifice test, as the Government advocates here, would shield from the antitrust laws conduct by Verizon that, in other situations might be entirely profitable even if it did not harm competition, but that Congress has expressly found to be anticompetitive and damaging to the public interest in the local telephone arena.[9]

The Government's claim that sacrifice must be the sole test of willfulness in all refusal-to-deal cases because if monopolists were required to deal with competitors that could result in "collusion" or depress innovation by entrants, Gov't

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[9] *Amici* question, however, how a court, at the motion to dismiss stage, could conclude that Respondent will be unable to establish that Verizon's refusal to deal entails profit sacrifice. It is hardly self-evident that provision of wholesale access at regulated rates would be less profitable on a per unit basis than use of the facilities to provide retail service at regulated rates. That can only be confirmed by analyzing the pertinent costs and revenues. Moreover, even if provision of wholesale access were less profitable on a per unit basis, it is not self-evident that retail competition and innovation facilitated by wholesale access would not stimulate demand and allow Verizon to make up the difference by selling more units, indicating that the "opportunity" cost of dealing with rivals may be lower than the incumbent claims.

Br. at 17, is also misplaced. Where an incumbent controls natural monopoly facilities that cannot be economically duplicated – such as the ubiquitous network of loops, switches and transport facilities controlled by Verizon[10] – there will be *no* entry and innovation by would-be competitors absent access to the incumbent's facilities.

Indeed, taken to its logical extreme, the Government's position would call into question the government's landmark antitrust suit to break up the Bell System. Under strict application of the sacrifice test, it is difficult to see how AT&T's refusal to grant MCI and other would-be long distance rivals "access" to its ubiquitous local networks could have been deemed "willful." AT&T would have argued that granting access to its competitors would have lowered its long distance profits and, therefore, by refusing to cooperate, it was not sacrificing its profits, even apart from the "lessening of competition." But that argument, like the Government's argument here, ignores the critical fact that AT&T's denial of

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[10] As this Court explained in *Verizon*:

> It is easy to see why a[n incumbent telephone carrier] would have an almost insurmountable competitive advantage not only in routing calls within the exchange, but, through its control of this local market, in the markets for terminal equipment and long-distance calling as well. A newcomer could not compete with the incumbent carrier to provide local service without coming close to replicating the incumbent's entire existing network, the most costly and difficult part of which would be laying down the "last mile" of feeder wire, the local loop, to the thousands (or millions) of terminal points in individual houses and businesses.

Verizon, 535 U.S. at 490. The Federal Communications Commission has likewise found that, as a general matter, new entrant competitive carriers cannot economically replicate the local networks of incumbent carriers. *See generally Implementation of the Local Competition Provisions of the Telecomms. Act of 1996*, 15 FCC Rcd. 3696 (1999).

access was found to be in direct violation of regulation intended to promote long distance competition.

The Government's attempt to give the sacrifice test a broader role that it can undertake on the foundation of valid economics would even lead to dismissal of cases in which there is direct objective evidence of willfulness, quite apart from profit sacrifice. Where the challenged conduct is independently unlawful there should be no presumption (based upon the sacrifice test or any substitute criterion) that the conduct is pro-competitive merely because it is allegedly "profit-maximizing" to the defendant. Rather, in such a setting, the fact-finder should directly examine the economic logic and market consequences that flow from the defendant's decision to disregard regulations whose express purpose is to foster competition. And where it is clear that the defendant has violated a regulation that is intended to promote competition and that there is a reasonable likelihood that the defendant will gain or preserve monopoly power as a result of that violation, a *prima facie* case of "willfulness" has been established. This "causation" requirement is satisfied when the plaintiff can show that the ability of some efficient rivals to compete has been significantly reduced, that these rivals are important to the state of competition, and that there is no reasonable expectation of resulting significant entry or expansion by others not so impeded by the challenged conduct.

Amici do not suggest, of course, that antitrust courts should deem the demonstration of a *prima facie* case by a plaintiff to establish automatically a violation of section 2. Even in the case where a defendant has violated a competition-enhancing law and has the prospect of gaining or enhancing market power as a result of that violation, the defendant should still have the opportunity to prove that its refusal to deal is justified by a legitimate business practice (apart from the defense that the conduct must be *presumed* to be legitimate

because it was profit-driven). But whether such a credible and substantial legitimate business justification exists is clearly a factual issue to be resolved by the jury (if there is sufficient evidence for the complaint to survive summary judgment), and not on a motion to dismiss.

The Government conflates the two independent lines of inquiry. In its summary of the Court's recent decision upholding the Federal Communications Commission ("FCC") rules that govern the prices incumbent carriers can charge competitors for wholesale access to their networks, the Government notes that "[t]he resulting pricing rules may require ILECs to provide new entrants with access . . . at rates that are below the ILEC's historical cost [and the] resulting rules may also generate less revenue for the ILEC than would selling to retail customers directly." Gov't Br. at 3 (internal citations omitted). The Government is correct insofar as it asserts that a refusal to provide access at rates that are genuinely below production cost could conceivably serve as a legitimate basis for refusal to deal apart from its effects on competition (although *Amici* agree with the FCC and this Court that the FCC's "TELRIC" standard results in rates for access to incumbent network facilities that are not "below cost" in any economically defensible sense). But the same cannot be said about the refusal to sell if it is linked to the goal of *preserving* current margins on retail sales which are higher than margins earned on the "unbundled network elements" that the incumbents are required to lease to competitors. That is because Congress has expressly repudiated the existing pricing structure and determined that mandatory access is necessary to enable competition to push prices downward toward competitive levels. Although incumbent telephone monopolists evidently should not be required to go bankrupt for the sake of aiding rivals, their conduct should not be immunized from the antitrust laws simply because that conduct is profit-driven, given that Congress explicitly opened local telephone markets to

competition, *inter alia*, in order to eliminate supracompetitive profit margins. That is particularly true where, as here, regulators (and the Court) have expressly found that the standard used to set rates for wholesale access is fully compensatory of production costs and will not materially deter incumbents' incentives to innovate. *Verizon*, 535 U.S. at 517-23 & n.33.

And to the extent that the Government suggests that "willfulness" under section 2 of the Sherman Act must be evaluated without regard to the existence and operation of the Telecommunications Act of 1996 because of the Act's "savings clause," Gov't Br. at 18, its argument is precisely backwards. The savings clause provides only that "nothing in this Act or amendments made by this Act shall be construed to modify, impair, or supersede the *applicability* of any of the antitrust laws." Telecommunications Act of 1996, Pub. L. No. 104-104, § 601(b), 110 Stat. 56, 143 (emphasis added) (codified at 47 U.S.C. § 152 note). Treating violations of the Act as probative evidence of willfulness imposes no change in the "applicability" of the antitrust laws. On the contrary, requiring antitrust courts to ignore such evidence, as the Government seeks to require, would do so. "'The impact of regulation on pricing and other competitive factors is too obvious to be ignored'" and "'must be assessed simply as another fact of market life.'" *Phonetele, Inc.* v. *AT&T Co.*, 664 F.2d 716, 742 (9th Cir. 1981) (Kennedy, J.). "'Just as the administrative agency must consider the competitive premises of the antitrust laws, the antitrust court must consider the peculiarities of an industry as recognized in a regulatory statute.'" *Id.* (quoting 1 P. Areeda & D. Turner, *Antitrust Law* ¶ 223d (1978)).

In sum, where Congress has found that the public interest is not well-served by particular conduct, notwithstanding the fact that it may be profit maximizing to the parties engaged in that conduct, there is no economically sound basis for a

strong (or, under the Government's view, dispositive) presumption that unilateral firm conduct that is profitable apart from its prospect of monopolizing the relevant market(s) should not be actionable under section 2. In promoting a broader role for the sacrifice test, the Government has ignored this limiting principle. Of course, *Amici* generally and strongly support the "sacrifice" standard, as evidenced by their own writings. However, support of this economically desirable standard must be informed and tempered by the broader public policy context in which antitrust defendants' market behavior must be examined. The sacrifice standard cannot be applied unthinkingly and automatically "across-the-board" and is simply not apposite where the challenged conduct is alleged to violate direct rules regulating natural monopolies that are intended to foster competition.

CONCLUSION

For all of the foregoing reasons, the *Amici* urge the Court to affirm the decision of the Second Circuit.

Respectfully submitted,

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APPENDIX

BACKGROUND AND QUALIFICATIONS OF *AMICI CURIAE*

WILLIAM J. BAUMOL

Curriculum Vitae

January 2003

Born February 26, 1922, New York, NY
Married, two children
BSS College of the City of New York, 1942
Ph.D. University of London, 1949
1942-43, 1946: Junior Economist, U.S. Dept. of Agriculture
1947-49: Assistant Lecturer, London School of Economics
1949-92: Professor of Economics, Princeton University
1983-2000: Director, C.V. Starr Center for Applied Economics, New York University

Current joint appointments:

Since 1992: Princeton University, Senior Research Economist & Emeritus Professor of Economics

Since 1971: New York University, Professor of Economics

AWARDS & HONORS:

1953 Fellow, Econometric Society

1965 Honorary LL.D, Rider College (Trustee, 1960-70)

1968 Joseph Douglas Green 1895 Professorship of Economics, Princeton University

1970 Honorary Fellow, London School of Economics, England

1971 Elected Member, American Academy of Arts and Sciences

1971 Honorary Doctorate, Stockholm School of Economics, Sweden

1973 Honorary Doctor of Humane Letters, Knox College 1973 Honorary Doctorate, University of Basel, Switzerland

1975 John R. Commons Award, Omicron Delta Epsilon

1975 Townsend Harris Medal, Alumni Assoc. of the City College of New York

1977 Elected Member, American Philosophical Society

1982 Distinguished Fellow, American Economic Association

1984 Distinguished Member, Economic Association of Puerto Rico

1986 Winner, Assoc. of American Publishers Award for Best Book in Business, Management and Economics, *Superfairness: Applications and Theory*

1987 Recipient, Frank E. Seidman Distinguished Award in Political Economy

1987 Elected Member, National Academy of Sciences

1989 Winner, Assoc. of Am. Publishers Annual Awards for Excellence in Publishing, Honorable Mention in Social Sciences, *Productivity and American Leadership: The Long View*

1992 Recipient, First Senior Scholar in the Arts and Sciences Award, New York University

1993 Winner, Assoc. of Environmental and Resource Economists Award for Publication of Enduring Quality, *The Theory of Environmental Policy*

1996 Honorary Degree, University of Limburg, Maastricht, Netherlands

1996 Honorary Professorship, University of Belgrano, Buenos Aires, Argentina

1997 Henry H. Villard Research Award, National Council on Economic Education and National Association of Economic Educators

1997 Docteur Honoris Causa, Universite des Sciences et Technologies de Lille, Lille, France

1999 Doctor Philosophiae Honoris Causa, Hebrew University of Jerusalem, Israel

1999 Doctor of Humane Letters Honoris Causa, Princeton University

2001 Docteur Honoris Causa, University of Paris, Sorbonne, France

2001 Elected Member, Accademia Nazionale Dei Lincei, Rome, Italy

2003 International Award for Entrepreneurship and Small Business Research, Swedish Foundation for Small Business Research and Swedish Business Development Agency

PROFESSIONAL ACTIVITIES:

Member, Board of Directors, Theater Development Fund

Correspondent, Committee on Human Rights, and member, Committee on the National Institute for the Environment, National Academy of Sciences

Member, Editorial Board of the Journal of Entrepreneurial Finance and Business Ventures

Past President: American Economic Association (1981), Association of Environmental and Resource Econo-

mists (1979), Eastern Economic Association (1978-79), Atlantic Economic Society (1985)

Past Chairman and Member, Economic Policy Council, State of New Jersey (1967-75)

Past Vice President (1968-70) and Chairman, Committee on Economic Status of the Profession (1962-70), American Association of University Professors

At various times on editorial and/or advisory boards for: *American Economic Review*; *Kyklos*; *Journal of Economic Literature*; *Journal of Cultural Economics*; *Journal of Economic Perspectives*; *Management Science*; *Economic Notes (Italy)*; *Journal of Economic Education*; *Impresa e Concorrenza (Italy)*; *THESIS: Theory and History of Economic and Social Institutions and Structures (USSR)*; *Feminist Economics*; *Japan and the World Economy*; *Supreme Court Economic Review*; *Economia: Revista Quadrimestral (Portugal)*.

Frequent consultant to government and industry, in U.S. and many other countries.

BOOKS PUBLISHED:

Economic Dynamics (with R. Turvey), 1951, 3rd ed. 1970.

Welfare Economics and the Theory of the State, 1952, 1965.

Economic Processes and Policies (with L.V. Chandler), 1954.

Business Behavior, Value and Growth, 1959, 2nd ed. 1966.

What Price Economic Growth? (with K. Knorr), 1961.

Economic Theory and Operations Analysis, 1961, 4th ed. 1976.

The Stock Market and Economic Efficiency, 1965.

Performing Arts: The Economic Dilemma (with W.G. Bowen), 1966.

Precursors in Mathematical Economics: An Anthology (with S.M. Goldfeld), 1968.

Portfolio Theory: The Selection of Asset Combinations, 1970.

Economics of Academic Libraries (with M. Marcus), 1973.

The Theory of Environmental Policy (with W.E. Oates), 1975, 2nd ed. 1988.

Selected Economic Writings of William J. Baumol, E.E. Bailey, ed., 1976.

Economics, Environmental Policy, and the Quality of Life (with W.E. Oates and S.A. Batey Blackman), 1979.

Economics: Principles and Policy (with A.S. Blinder), 1979, 9th ed. 2002.

Public and Private Enterprise in a Mixed Economy (ed.), 1980.

Contestable Markets and the Theory of Industry Structure (with R.D. Willig and J.C. Panzar), 1982, revised ed. 1988.

Inflation and the Performing Arts (ed. with H. Baumol), 1984.

Productivity Growth and U.S. Competitiveness (ed. with K. McLennan), 1985.

Superfairness: Applications and Theory, 1986.

Microtheory: Applications and Origins, 1986 (compendium of Baumol articles).

The Information Economy and the Implications of Unbalanced Growth (with L. Osberg and E.N. Wolff), 1989.

Productivity and American Leadership: The Long View (with S.A. Batey Blackman and E.N. Wolff), 1989, paperback ed. 1991.

The Economics of Mutual Fund Markets: Competition vs. Regulation (with S.M. Goldfeld, L.A. Gordon and M.F. Koehn), 1990.

Perfect Markets and Easy Virtue: Business Ethics and the Invisible Hand (with S.A. Batey Blackman), 1991.

Entrepreneurship, Management and the Structure of Payoffs, 1993.

Toward Competition in Local Telephony (with J.G. Sidak), 1994.

Convergence of Productivity: Cross-National Studies and Historical Evidence (ed. with R.R. Nelson and E.N. Wolff), 1994.

Transmission Pricing and Stranded Costs in the Electric Power Industry (with J. Gregory Sidak), 1995.

Assessing Educational Practices: The Contribution of Economics (ed. with W.E. Becker), 1995.

Baumol's Cost Disease: The Arts and Other Victims (Ruth Towse, ed.), 1997 (compendium of Baumol articles).

Global Trade and Conflicting National Interests (with Ralph E. Gomory), 2000.

Welfare Economics (ed. with C.A. Wilson), Vol. I, II, III, 2001.

The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism, 2002.

Downsizing in America: Reality, Causes, and Consequences (with A.S. Blinder and E.N. Wolff), forthcoming in 2003.

Growth, Industrial Organization and Economic Generalities, forthcoming in 2003 (compendium of Baumol articles).

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EDUCATION

1968-1973 Columbia University, New York, New York
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Doctoral Dissertation: Three Essays on Economic Theory, May 1973. Ph.D. 1973.

1967-1968 McGill University, Montreal, Canada
Departments of Economics and Political Science

1963-1966 Warsaw University, Warsaw, Poland
Department of Political Economy. B.A. (equiv.), 1966.

HONORS

1973 Columbia University: Highest distinction for the doctoral dissertation

1971-1972 Columbia University: Honorary President's Fellow

1969-1971 Columbia University: President's Fellow

1967-1968 McGill University: Honors Student

1964, 1965 Warsaw University: Award for Academic Achievement, Department of Political Economy

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Who's Who in the East

PROFESSIONAL EXPERIENCE

June 1982 - present — Professor of Economics
Department of Economics, New York University, New York, New York

Sept. 1996 - Aug. 2001 — Director of Masters in Economics Program
Department of Economics, New York University, New York, New York

Summer 1996-2000 — Lecturer
International Program on Privatization and Reform
Institute for International Development, Harvard University, Cambridge, Massachusetts

Aug. 1991 - Oct. 1992 — Deputy Assistant Attorney General for Economics
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Sept. 1989 - July 1990 — Visiting Professor of Economics
School of Management, Yale University, New Haven, Connecticut

Lecturer in Law
Yale Law School

Mar. 1984 - June 1988 — Visiting Professor of Economics
Universita Commerciale "Luigi Bocconi", Milian, Italy

June 1982 - Feb. 1985 — Director of Graduate Studies
Department of Economics, New York University

Sept. 1982 - June 1986	Adjunct Professor of Law (part-time) Columbia University Law School, New York, New York
Feb. 1982 - June 1982	Acting Director of Graduate Studies Department of Economics, New York University
June 1978 - June 1982	Associate Professor of Economics Department of Economics, New York University
Sept. 1979 - May 1990	Lecturer in Economics and Antitrust New York University Law School
Sept. 1977 - June 1978	Member, Technical Staff Bell Laboratories, Holmdel, New Jersey
	Associate Professor of Economics Columbia University
	Visiting Research Scholar Center for Law and Economics, University of Miami, Miami, Florida
Sept. 1973 - Aug. 1977	Assistant Professor of Economics New York University
Summer 1976	Fellow, Legal Institute for Economists, Center for Law and Economics, University of Miami
Summer 1976	Visiting Researcher Bell Laboratories, Holmdel, New Jersey

OTHER PROFESSIONAL ACTIVITIES

2002 - present 1998 - present	Director, Competition Policy Associates, Washington, D.C. Senior Consultant Applied Economic Solutions, Inc., San Francisco, California
1997 - present	Board of Editors, Antitrust Report

1997 - 1999	Consultant, Inter-American Development Bank, Washington, D.C.
1995 - 2001	Consultant, The World Bank, Washington, D.C.
1995 - 2000	Senior Affiliate Cornerstone Research, Inc., Palo Alto, California
various	Testimony at Hearings of the Federal Trade Commission
1994 - 1996	Senior Affiliate Law and Economics Consulting Group, Emoryville, California
1994 - 2000	Senior Affiliate Consultants in Industry Economics, LLC, Princeton, New Jersey
1993 - 1994	Director Consultants in Industry Economics, Inc., Princeton, New Jersey
1992 - 1993	Vice-Chair (pro tempore) Economics Committee, American Bar Association, Chicago, Illinois
1992 - 1995 1990 - 1991	Senior Consultant Organization for Economic Cooperation and Development, Paris, France
1991	Member *Ad hoc* Working Group on Bulgaria's Draft Antitrust Law The Central and East European Law Initiative American Bar Association
1990 - 1991	Advisor Polish Ministry of Finance and Anti-Monopoly Office Warsaw, Poland

1990 - 1991	Member Special Committee on Antitrust Section of Antitrust Law, American Bar Association
1990 - 1991	Director and Senior Advisor Putnam, Hayes & Bartlett, Inc., Washington, D.C.
1990 - 1996	Member Predatory Pricing Monograph Task Force Section of Antitrust Law, American Bar Association
1989	Hearings on Competitive Issues in the Cable TV Industry Subcommittee on Monopolies and Business Rights of the Senate Judiciary Committee Washington, D.C.
1989	Member EEC Merger Control Task Force, American Bar Association
1988 - present	Associate Member American Bar Association
1987 - 1989	Adjunct Member Antitrust and Trade Regulation Committee, The Association of the Bar of the City of New York
1984	Speaker, "Industrial and Intellectual Property: The Antitrust Interface" National Institutes, American Bar Association, Philadelphia, Pennsylvania
1983 - 1990	Director Consultants in Industry Economics, Inc
1982	Member Organizing Committee

	Tenth Annual Telecommunications Policy Research Conference, Annapolis, Maryland
1981	Member Section 7 Clayton Act Committee, Project on Revising Merger Guidelines American Bar Association
1980	Organizer Invited Session on Law and Economics American Economic Association Meetings, Denver, Colorado
1978 - 1979	Member Department of Commerce Technical Advisory Board Scientific and Technical Information Economics and Pricing Subgroup
1978 - present	Referee for numerous scholarly journals, publishers, and the National Science Foundation

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

American Economic Association
American Bar Association

PUBLICATIONS

A. Journal Articles

"All-units Discounts in Retail Contracts," with S. Kolay and G. Shaffer, *J. of Economics and Management Strategy*, (forthcoming).

"Archimedean Leveraging and the GE/Honeywell Transaction," with R. J. Reynolds, *Antitrust Law Journal*, vol. 70, no. 1, 2002, 171-98.

"Entrepreneurship, Access Policy and Economic Development: Lessons from Industrial Organizations," with

M. A. Dutz and R. D. Willig, *European Economic Review*, vol. 4, no. 4-6, May 2000.

"Parity Pricing and its Critics: Necessary Condition for Efficiency in Provision of Bottleneck Services to Competitors," with W. J. Baumol and R. D. Willig, *Yale Journal on Regulation*, vol. 14, Winter 1997, 146-63.

"Competition and Trade Law and the Case for a Modest Linkage," with E. Fox, *World Competition, Law and Economics Review*, vol. 19, December 1995, 5-34.

"On the Perils of Vertical Control by a Partial Owner of Downstream Enterprise," with W.J. Baumol, *Revue D'économie industrielle*, No. 69, 3^{e} trimestre 1994, 7-20.

"Competition Policy for Natural Monopolies in Developing Market Economy," with R.W. Pittman and P. Clyde, *Economics of Transition*, vol. 2, no. 3, September 1994, 317-343. Reprinted in B. Clay (ed), *De-monopolization and Competition Policy in Post-Communist Economies*, Westview Press 1996, 159-193.

"The 1992 Agency Horizontal Merger Guidelines and the Department of Justice's Approach to Bank Merger Analysis," with M. Guerin-Calvert, *Antitrust Bulletin*, vol. 37, no. 3, 667-688. Reprinted in *Proceedings of the 1992 Conference on Bank Structure and Competition: Credit Markets in Transition*, Federal Reserve Bank of Chicago, 1992, 541-560.

"Entry Analysis Under the 1992 Horizontal Merger Guidelines," with Jonathan B. Baker, *Antitrust Law Journal*, vol. 61, no. 1, Summer 1992, 139-146.

"Economics and the 1992 Merger Guidelines: A Brief Survey," with Robert D. Willig, *Review of Industrial Organization*, vol. 8, 139-150, 1993. Reprinted in E. Fox and J. Halverson (eds.), *Collaborations Among Competitors: Antitrust Policy and Economics*, American Bar Association, 1992, 639-652.

"Equilibrium Vertical Foreclosure: A Reply," with G. Saloner and S.C. Salop, *American Economic Review*, vol. 82, no. 3, 1992, 698-703.

"A Patent System for Both Diffusion and Exclusion," *Journal of Economic Perspectives*, vol. 5, Winter 1991, 43-60.

"R&D Cooperation and Competition," with M. Katz, *Brookings Papers on Economic Activity: Microeconomics*, 1990, 137-203.

"Equilibrium Vertical Foreclosure," with G. Saloner and S. Salop, *American Economic Review*, vol. 80, March 1990, 127-142.

"Antitrust Policy for High-Technology Industries," with W.J. Baumol, *Oxford Review of Economic Policy*, vol. 4, Winter 1988, 13-34. Reprinted in E. Fox and J. Halverson (eds.), *Collaborations Among Competitors: Antitrust Policy and Economics*, American Bar Association, 1991, 949-984.

"Conflicts of Jurisdiction: Antitrust and Industrial Policy," *Law and Contemporary Problems*, vol. 50, Summer 1987, 165-178.

"Market Structure and Optimal Management Organization," with C. Bull, *Rand Journal of Economics*, vol. 18, no. 4, Winter 1987, 480-491.

"A Sequential Concession Game with Asymmetric Information," with A. Rubinstein, *Quarterly Journal of Economics*, vol. 101, no.4, November 1986, 879-888.

"The G.M.-Toyota Joint Venture: An Economic Assessment," with C. Shapiro, *Wayne Law Journal*, vol. 31, no. 4, 1985, 1167-1194.

"Economic Foundations and Considerations in Protecting Industrial and Intellectual Property: An Introduction," *ABA Antitrust Law Journal*, vol. 53, no. 3, 1985. 503-518, Comments, 523-532.

"Antitrust for High-Technology Industries: Assessing Research Joint Ventures and Mergers," with R.D. Willig, *Journal of Law and Economics*, vol. 28, May 1985, 311-334.

"Use of Antitrust to Subvert Competition," with W.J. Baumol, *Journal of Law and Economics*, vol. 28, May 1985, 247-266. Reprinted in *Journal of Reprints for Antitrust Law and Economics*, vol. 16, no. 2.

"Advances in Supervision Technology and Economic Welfare: A General Equilibrium Analysis," with C. Shapiro, *Journal of Public Economics*, vol. 25/3, 1985, 371-390.

"Predatory Systems Rivalry: A Reply," with A. O. Sykes and R. D. Willig, 83 *Columbia Law Review*, June 1983, 1150-1166. Reprinted in *Corporate Counsel*, Matthew Bender & Company, 1984, 433-450.

"The 1982 Department of Justice Merger Guidelines: An Economic Assessment," with R. D. Willig, 71 *California Law Review*, March 1983,535-574. Reprinted in *Antitrust Policy in Transition: The Convergence of Law and Economics*, E. Fox and J. Halverson (eds.), American Bar Association Press, 1984, 267-304.

"Unfair International Trade Practices," with A. O. Sykes and R. D. Willig, 15 *Journal of International Law and Politics*, Winter 1983, 323-338.

"On Non-linear Pricing of Inputs," with J. Panzar, *International Economic Review*, October 1982, 659-675.

"Herfindahl Concentration, Rivalry and Mergers," with A. O. Sykes and R. D. Willig, *Harvard Law Review*, vol. 95, June 1982, 1857-1875.

"A Reply to 'Journals as Shared Goods: Comment,'" with R. D. Willig, *American Economic Review*, June 1982, 603-607.

"Proposed Revisions to the Justice Department's Merger Guidelines," with S. Edwards, *et al.*, *Columbia Law Review*, vol. 81, December 1981, 1543-1591.

"An Economic Definition of Predation: Pricing and Product Innovation," with R.D. Willig, *Yale Law Journal*, vol. 91, November 1981, 8-53.

"On the Consequences of Costly Litigation in the Model of Single Activity Accidents: Some New Results," *Journal of Legal Studies*, June 1981, 269-291.

"On the Political Sustainability of Taxes," with A. Schotter, *American Economic Review Papers and Proceedings*, May 1981, 278-282.

"Information and the Law: Evaluating Legal Restrictions on Competitive Contracts," with A. Weiss, *American Economic Review Papers and Proceedings*, May 1981, 399-404.

"Redistributing Incomes: *Ex Ante* or *Ex Post*," *Economic Inquiry*, April 1981, 333-349.

"On the Nonexistence of *Pareto Superior* Outlay Schedules," with J. Panzar, *The Bell Journal of Economics*, Spring 1980, 351-354.

"The Role of Information in the Design of Public Policy Towards Externalities," with R. D. Willig, *Journal of Public Economics*, December 1979, 271-299.

"On the Concept of Optimal Taxation in the Overlapping-Generations Model of Efficient Growth," with E.S. Phelps, *Journal of Public Economics*, August 1979, 1-27.

"Products Liability in Markets With Heterogeneous Consumers," *Journal of Legal Studies*, June 1979, 505-525.

"Costly Litigation and the Tort Law: Single Activity Accidents," *Journal of Legal Studies*, June 1978, 243-261.

"On the Optimal Provision of Journals Qua Excludable Public Goods," with R. D. Willig, *American Economic Review*, June 1978, 324-338.

"Distortionary Wage Differentials in a Two-Sector Growth Model: Some Theorems on Factor Earnings," *International Economic Review*, June 1978, 321-333.

"On the Optimality of Public-Goods Pricing with Exclusion Devices," with W.J. Baumol, *Kyklos*, Fasc. 1, 1977, 5-21.

"Public Good Properties in Reality: The Case of Scientific Journals," with W.J. Baumol, *Proceedings of the ASIS Meetings*, San Francisco, October 1976.

"Merger Illusions and Externalities: A Note," with A. Schotter, *Eastern Economic Review*, November 1976, 19-21.

"Distributive Justice and Optimal Taxation of Wages and Interest in a Growing Economy," *Journal of Public Economics*, January 1976, 139-160.

"Linear Taxation of Wealth and Wages for Intragenerational Lifetime Justice: Some Steady-State Cases," with E.S. Phelps, *American Economic Review*, September 1975, 660-673.

B. Books and Monographs

Proceedings of the Tenth Annual Telecommunications Policy Research Conference, editor with O. Gandy and P. Espinosa, ABLEX Publishers, 1983.

Obstacles to Trade and Competition, with L. Goldberg, OECD, Paris, 1993.

Predatory Pricing, with William Green, *et al.*, American Bar Association, Section of Antitrust Law, Monograph 22, 1996.

C. Book Chapters

"Practical Rules for Pricing Access in Telecommunications," with R. D. Willig, Chap. 6, in *Second-Generations Reforms in Infrastructure Services*, F. Besanes and R. D. Willig (eds.), Inter-American Development Bank, Washington, D.C., April 2002, 149-76.

"Sustainable Privatization of Latin American Infrastructure: The Role of Law and Regulatory Institutions," with Evamaria Uribe, Chap. 1 in F. Basanes, E. Uribe, R. D. Willig (eds.), *Can Privatization Deliver? Infrastructure for Latin America*, The Johns Hopkins U. P. for Inter-American Development Bank, 1999, 9-32.

"Access and Bundling in High-Technology Markets," with R. D. Willig, Chap. 6, in J. A. Eisenach and T. M. Leonard, (eds.), *Competition, Innovation, and the Microsoft Monopoly: The Role of Antitrust in the Digital Marketplace*, Kluver Academic Press, 1999, 103-29.

"The Harmonization of Competition and Trade Law," with E. Fox, Chap. 15 in L. Waverman, *et al.* (eds.), *Competition Policy in the Global Economy*, Routledge, 1997, 407-439.

"Transition to a Market Economy: Some Industrial Organization Issues," with M. Iwanek, Chap. 7 in H. Kierzkowski, *et al.* (eds.), *Stabilization and Structural Adjustment in Poland*, Routledge, 1993, 133-170.

"Competition Policies for Natural Monopolies in a Developing Market Economy," with Russell Pittman, *Butterworth's Trade and Finance in Central and Eastern Europe*, Butterworth Law Publishers Ltd., 1993, 78-88, Reprinted in *Journal for Shareholders* (published by the Russian Union of Shareholder), Moscow, January 1993, 33-36; *Versenyfelugyeleti Ertesito* (Bulletin of Competition Supervision), Budapest, vol. 3, no. 1-2, January 1993, 30-41; *Narodni Hospodarstvi* (National Economy), Prague; *ICE: Revista de Economia*, No. 736 (December 1994) (in Spanish), 69-90.

"Antitrust: Source of Dynamic and Static Inefficiencies?" with W.J. Baumol, in T. Jorde and D. Teece (eds.), *Antitrust, Innovation, and Competitiveness*, Oxford University Press, 1992, 82-97. Reprinted in "The Journal of Reprints for Antitrust Law and Economics," vol. 26, no. 1, 1996.

"Economic Foundations of Competition Policy: A Review of Recent Contributions," in W. Comanor, *et al.*, *Competition Policy in Europe and North America: Economic Issues and*

Institutions, Fundamentals of Pure and Applied Economics (Vol. 43), Harwood Academic Publishers, 1990, 7-42.

"The Department of Justice 1988 Guidelines for International Operations: An Economic Assessment," with A.O. Sykes, in B. Hawk (ed.), *European/American Antitrust and Trade Laws*, Matthew Bender, 1989, 4.1-4.18.

"Predation, Monopolization, and Antitrust," with G. Saloner, in R. Schmalensee and R.D. Willig (eds.), *Handbook of Industrial Organization*, vol. 1, North Holland, 1989, 538-596.

"Supervision Technology, Firm Structure, and Employees' Welfare," in *Prices, Competition and Equilibrium*, M. Peston and R.E. Quandt (eds.), Philip Allan Publishers, Ltd., 1986, 142-163.

"Perspectives on Mergers and World Competition," with R.D. Willig, in *Antitrust and Regulation*, R. Grieson (ed.), Lexington Books, 1986, 201-218.

"Transnational Antitrust and Economics," in *Antitrust and Trade Policies in International Trade*, B. Hawk (ed.), Matthew Bender, 1985, 233-248.

"Pricing of Interexchange Access: Some Thoughts on the Third Report and Order in FCC Docket No. 78-72," in *Proceedings of the Eleventh Annual Telecommunications Policy Research Conference*, Vincent Mosco (ed.), ABLEX Publishers, 1984, 145-161.

"Non-Price Anticompetitive Behavior by Dominant Firms Toward the Producers of Complementary Products," with A.O. Sykes and R.D. Willig, in *Antitrust and Regulation: Essays in Memory of John McGowan*, F. Fisher (ed.), MIT Press, 1985, 315-330.

"Local Telephone Pricing in a Competitive Environment," with R.D. Willig, in *Regulating New Telecommunication*

Networks, E. Noam (ed.), Harcourt Brace Jovanovich, 1983, 267-289.

"An Economic Definition of Predatory Product Innovation," with R.D. Willig, in *Strategy, Predation and Antitrust Analysis*, S. Salop (ed.), Federal Trade Commission, 1981, 301-396.

"Marginal Cost," in *Encyclopedia of Economics*, D. Greenwald (ed.), McGraw-Hill, 2nd ed. 1994, 627-630.

"Understanding Economic Justice: Some Recent Developments in Pure and Applied Welfare Economics," in *Economic Perspectives*, M. Ballabon (ed.) Harwood Academic Publishers, vol. 1, 1979, 51-72.

"Problems of Political Equilibrium in the Soviet Proposals for a European Security Conference," in *Columbia Essays in International Affairs*, Andrew W. Cordier (ed.) Columbia University Press, New York, 1971, 1951-197

D. Other Publications

"Predatory Pricing," in Peter Newman (ed.), *The New Palgrave Dictionary of Economics and the Law*, Grove Dictionaries, New York, 1999.

Book review of L. Phlips, *Competition Policy: A Game Theoretic Perspective*, reviewed in *Journal of Economic Literature*, vol. 35, No.3, September 1997, 1408-9.

"The Role of Efficiencies in Merger Assessment: The 1997 Guidelines," *Antitrust Report*, September 1997, 10-17.

"Bingaman's Antitrust Era," *Regulation*, vol. 20, No. 2, Spring 1997, 21-26.

"Competition Policy for High-Technology Industries," *International Business Lawyer*, vol. 24, No. 10, November 1996, 479-82.

"Internationalizing Competition Law to Limit Parochial State and Private Action: Moving Towards the Vision of World

Welfare," with E.M. Fox, *International Business Lawyer*, vol. 24, No. 10, November 1996, 458-62.

"Economists' View: The Department of Justice Draft for the Licensing and Acquisition of Intellectual Property," *Antitrust*, vol. 9, No. 2, Spring 1995, 29-36.

"Competition Policy During Transformation to a Centrally Planned Economy: A Comment," with R.W. Pittman, in B. Hawk (ed.), *1992 Fordham Corporate Law Institute*, 533-38.

"Poland: The First 1,000 Days and Beyond," *Economic Times*, vol. 3, no. 9, October 1992, 6-7.

"Interview: Janusz A. Ordover: A Merger of Standards? The 1992 Merger Guidelines," *Antitrust*, vol. 6, no. 3, Summer 1992, 12-16.

"Interview: U.S. Justice Department's New Chief Economist: Janusz A. Ordover," *International Merger Law*, no. 14, October 1991.

"Poland: Economy in Transition," *Business Economics*, vol. 26, no. 1, January 1991, 25-30.

"Economic Analysis of Section 337: Protectionism versus Protection of Intellectual Property," with R.D. Willig, in *Technology, Trade and World Competition*, JEIDA Conference Proceedings, Washington, D.C., 1990, 199-232.

"Eastern Europe Needs Antitrust Now," with E. Fox, *New York Law Journal*, November 23, 1990, 1-4.

"Understanding Econometric Methods of Market Definition," with D. Wall, *Antitrust*, vol. 3, no. 3, Summer 1989, 20-25.

"Proving Entry Barriers: A Practical Guide to Economics of Entry," with D. Wall, *Antitrust*, vol. 2, no. 2, Winter 1988, 12-17.

"Proving Predation After Monfort and Matsushita: What the New 'New Learning' has to Offer," with D. Wall, *Antitrust*, vol. 1, no. 3, Summer 1987, 5-11.

"The Costs of the Tort System," with A. Schotter, Economic Policy Paper No. PP-42, New York University, March 1986. Reprinted in *Congressional Record*, U.S. Government Printing Office, Washington, D.C., 1987.

"An Economic Definition of Predation: Pricing and Product Innovation," with R.D. Willig, Report for the Federal Trade Commission, October 1982, 131 pp.

"Market Power and Market Definition," with R.D. Willig, Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, May 1981.

"Herfindahl Concentration Index," with R.D. Willig, Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, March 1981.

"Public Interest Pricing of Scientific and Technical Information," Report for the Department of Commerce Technical Advisory Board, September 1979.

"Economics of Property Rights as Applied to Computer Software and Databases," with Y.M. Braunstein, D.M. Fischer, W.J. Baumol, prepared for the National Commission on New Technological Uses of Copyrighted Works, June 1977, 140 pp. Reprinted in part in *Technology and Copyright*, R.H. Dreyfuss (ed.), Lemond Publications, 1978.

Book review of O. Morgenstern and G.L. Thompson, *Economic Theory of Expanding and Contracting Economies*, reviewed in *Southern Economic Journal*, September 1978.

"Manual of Pricing and Cost Determination for Organizations Engaged in Dissemination of Knowledge," with W.J. Baumol, Y.M. Braunstein, D.M. Fischer, prepared for the Division of Science Information, NSF April 1977, 150 pp.

UNPUBLISHED PAPERS

"All Units Discounts in Retail Contracts," with S. Kolay and G. Shaffer, August 2002.

"Economics, Antitrust and the Motion Picture Industry," C.V. Starr Center Policy Paper, July 1983.

"On Bargaining, Settling, and Litigating: A Problem in Multiperiod Games With Imperfect Information," with A. Rubinstein, C.V. Starr Working Paper, December 1982.

"Supervision and Social Welfare: An Expository Example," C.V. Starr Center Working Paper, January 1982.

"Should We Take Rights Seriously: Economic Analysis of the Family Education Rights Act," with M. Manove, November 1977.

"An Echo or a Choice: Product Variety Under Monopolistic Competition," with A. Weiss; presented at the Bell Laboratories Conference on Market Structures, February 1977.

GRANTS RECEIVED

Regulation and Policy Analysis Program, National Science Foundation, Collaborative Research on Antitrust Policy, Principal Investigator, July 15, 1985 - December 31, 1986.

Regulation of Economic Activity Program, National Science Foundation, Microeconomic Analysis of Antitrust Policy, Principal Investigator, April 1, 1983 - March 31, 1984.

Economics Division of the National Science Foundation, "Political Economy of Taxation," Principal Investigator, Summer 1982.

Sloan Workshop in Applied Microeconomics (coordinator), with W.J. Baumol (Principal Coordinator), September 1977 - August 1982.

Economics Division of the National Science Foundation, "Collaborative Research on the Theory of Optimal Taxation and Tax Reform," July 1979 to September 1980, with E.S. Phelps.

Division of Science Information of the National Science Foundation for Research on "Scale Economies and Public

Goods Properties of Information," W.J. Baumol, Y.M. Braunstein, M.I. Nadiri, Fall 1974 to Fall 1977.

National Science Foundation Institutional Grant to New York University for Research on Taxation and Distribution of Income, Summer 1974.

4/01

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Education

1975 Ph.D., Economics, Princeton University

1969 M.A., Economics, Princeton University

1969 M.P.A., (Master of Public Affairs) Woodrow Wilson School of Public & International Affairs, Princeton University

1967 B.A., Economics, Yale University, *cum laude* with High Honors in Economics

Experience

Principal, MICRA: Microeconomic Consulting and Research Associates, Inc., Washington, D.C.; August 1991 - present.

Resident Scholar, American Enterprise Institute for Public Policy Research, Washington, D.C.; May 1989 - April 1990, Adjunct Scholar, May 1990 - present.

Visiting Lecturer of Public and International Affairs, Woodrow Wilson School of Public and International Affairs, Princeton University, Princeton, NJ; Spring Semester, 1991.

Senior Vice President, ICF Consulting Associates, Inc., Washington, D.C.; November 1989 - August 1991.

Research Associate Professor of Psychology, The American University, Washington, D.C.; September 1983 - 1990.

Deputy Assistant Attorney General for Economic Analysis, Antitrust Division, U.S. Department of Justice, Washington, D.C.; October 1985 - May 1989.

Director, Economic Policy Office, Antitrust Division, U.S. Department of Justice, Washington, D.C.; September 1983 - September 1985.

Research Associate, Center for the Study of American Business, Washington University in St. Louis; July 1978 - June 1985.

Associate Professor, Department of Economics, Washington University in St. Louis; July 1978 - June 1985. Chairman, Graduate Committee, 1978 - 1980. Chairman, Undergraduate Committee, 1980 - 1983.

Assistant Professor, Department of Economics, Washington University in St. Louis; September1972 - June 1978.

Assistant in Instruction, Woodrow Wilson School of Public and International Affairs, Princeton University, Princeton, N.J.; 1969 - 1971.

Research Consultant, Ford Foundation, Kingston, Jamaica, W.I.; Summer 1969.

Fields Taught

Graduate: Industrial Organization, Economic Development and Planning, Microeconomic Theory, International Trade, International Finance, Economic Theories of Behavior, Applied Microeconomics.

Undergraduate: Government and Business, Industrial Organization, International Trade, International Finance, Economic Development, Intermediate Microeconomic

Theory, Intermediate Macroeconomic Theory, Introductory Microeconomic Theory, Introductory Macroeconomic Theory.

Grants

National Science Foundation. Grant title: "Income Maximizing in Choice and Rate Effects," 1988 - 1991.

National Science Foundation. Grant title: "Application of Economic Theory to Operant Schedule Effects," 1985 - 1987.

National Science Foundation. Grant title: "Income and Choice," 1983 - 1985.

Professional Activities

Referee, *American Economic Review, The Bell Journal of Economics/Rand Journal, Economic Inquiry, Industrial Organization Review, Journal of Industrial Economics, Journal of Law and Economics, Journal of Political Economy, Quarterly Journal of Economics, Southern Economic Journal.*

Member, Editorial Board, *International Journal of the Economics of Business.*

Member, American Bar Association, American Economic Association, Southern Economic Association, Western Economic Association.

Languages

French, German

Publications

"The Contribution of the Merger Guidelines to the Analysis of Non-Horizontal Mergers," 20th Anniversary of the 1982 Merger Guidelines: The Contribution of the Merger Guidelines to the Evolution of Antitrust Doctrine, on http://www.usdoj.gov/atr/hmerger.htm#papers.

"Staples and Office Depot: An Event-Probability Case Study," *Review of Industrial Organization*, 19: 469-481, 2001, with Serdar Dalkir.

"Optimizing in Choice When a Token Deposit is the Operant," *Journal of the Experimental Analysis of Behavior*, 2002, with J. J. Widholm, Alan Silberberg, S.R. Hursh, and A.A. Iman.

"Market Definition and the Price Effects of Mergers: Staples-Office Depot (1997)," in *The Antitrust Revolution: Economics, Competition and Policy*, John E. Kwoka and Lawrence J. White, eds.; Oxford University Press, third edition, 1999, with Serdar Dalkir.

"Unilateral Price Effects: Staples and Office Depot," in *The M&A Lawyer*, June 1998, Vol. 2, No. 3, with Serdar Dalkir. Available in revised form as "How Do You Know an Office Superstore? Staples and Office Depot," on http://www.antitrust.org/cases/.

"Resale Price Maintenance Reexamined: Monsanto v. Spray-Rite (1984)," in *The Antitrust Revolution: Economics, Competition and Policy*, John E. Kwoka and Lawrence J. White, eds.; Oxford University Press, third edition, 1999.

"Exclusionary Behavior in the Market for Operating System Software: the Case of Microsoft," in *Opening Networks to Competition: the Regulation and Pricing of Access*, David Gabel and David F. Weiman, eds.; Kluwer Academic Publishers, 1998, with Kenneth C. Baseman and Glenn A. Woroch.

"Riding the Wave: Exclusionary Practices in Markets for Microprocessors Used in IBM-Compatible Personal Computers," Conference and Festschrift in Honor of Merton J. Peck, Yale University, September 30, 1994, and *International Journal of the Economics of Business* 2-2 (July 1995), pp. 241-262, with Robert W. Wilson.

"The Economics of Intellectual Property Protection for Software: The Proper Role for Copyright," American Council on Interoperable Systems, Washington, D.C., June 1994, and *StandardView: ACM Perspectives on Standardization* 3-2 (June 1995), pp. 68-78, with Kenneth C. Baseman and Glenn A. Woroch.

"Microsoft Plays Hardball: Use of Nonlinear Pricing and Technical Incompatibility to Exclude Rivals in the Market for Operating Software," *The Antitrust Bulletin* 40-2 (Summer 1995), pp. 265-315, with Kenneth C. Baseman and Glenn F. Woroch.

"Copyright Protection of Software Can Make Economic Sense," *The Computer Lawyer*, 12 (February 1995), pp. 10, 18-28, with Kenneth C. Baseman and Glenn A. Woroch.

"Exclusionary Practices in High-Technology Industries," *The St. Louis Bar Journal*, 16 (Summer 1994), pp. 28-34.

"Monsanto v. Spray-Rite: Resale Price Maintenance Re-examined," in *The Antitrust Revolution: The Role of Economics*, John E. Kwoka and Lawrence J. White, eds.; Scott, Foresman and Company, Glenview, Illinois, second edition, 1994.

"A Commentary on the 1992 U.S. Merger Guidelines," *International Merger Law*, 22 (June 1992), pp. 14-19.

"The Use of Stock Market Returns in Antitrust Analysis of Mergers," *Review of Industrial Organization*, 7-1 (1992), pp. 1-11, and *Economic Analysis Group Discussion Paper #88-1*, January 1988, with Robert H. McGuckin and Peter Waldstein.

"Implications of U.S. Experience with Horizontal Mergers and Takeovers for Canadian Competition Policy," in *The Law and Economics of Competition Policy*, Frank Mathewson, Michael Trebilcock and Michael Walker, eds.; The Fraser Institute, Vancouver, B.C., 1990.

"Maricopa and Maximum-Price Agreements: Time for a New Legal Standard?" *Journal of Health Economics*, 7 (June 1988), pp. 185-190.

"Maximizing Present Value: A Model to Explain Why Moderate Response Rates Obtain on Variable-Interval Schedules," *Journal of the Experimental Analysis of Behavior*, 49 (May 1988), pp. 331-338, with Alan Silberberg and Toshio Asano.

"Sources of the 'Crisis' in Liability Insurance: An Economic Analysis," in *Yale Journal of Regulation*, 5 (Summer 1988), pp. 367-395; *Economic Analysis Group Discussion Paper* #88-2, February 1988; and *An Update on the Liability Crisis: Tort Policy Working Group*, U.S. Government Printing Office: 181-487:60075, March 1987, with Richard N. Clark and David D. Smith.

"State and Federal Regulation in the Market for Corporate Control," *The Antitrust Bulletin*, 32 (Fall 1987), pp. 661-691, and *Economic Analysis Group Discussion Paper* #86-4*, January 1986, with Margaret E. Guerin-Calvert and Robert H. McGuckin.

"Income and Choice Between Different Goods," *Journal of the Experimental Analysis of Behavior*, 48 (September 1987), pp. 263-275, with Alan Silberberg and David Shurtleff.

"Inferior-Good and Giffen-Good Effects in Monkey Choice Behavior," *Journal of Experimental Psychology: Animal Behavior Processes*, 13 (1987), pp. 292-301, with Alan Silberberg and Toshio Asano.

"Efficiencies, Failing Firms, and Alternatives to Merger: A Policy Synthesis," *The Antitrust Bulletin*, 31 (Summer 1986), pp. 431-450, and *Economic Analysis Group Discussion Paper* #86-14, August 1986, with John Kwoka.

Oil Pipeline Deregulation: Report of the U.S. Department of Justice, U.S. Government Printing Office: 1986, 491-510:40159, May 1986, with Charles J. Untiet.

"Merger Policy and Enforcement at the Antitrust Division: The Economist's View," *Antitrust Law Journal*, 54 (Spring 1985), pp. 109-115.

"Reanalysis of the Equation for Simple Action," *Journal of the Experimental Analysis of Behavior*, 43 (March 1985), pp. 265-277, with Alan Silberberg, Michael Gray and Randolph Ollom.

"Considering the Effects of Financial Incentive and Professional Ethics on 'Appropriate' Medical Care," *Journal of Health Economics*, 3 (December 1984), pp. 223-237, with Robert Woodward.

Deficits and Dollars: The Effects of Government Deficits in an International Economy. Center for the Study of American Business, Contemporary Series 3, 1982.

"Physician Productivity, Remuneration Method, and Supplier-Induced Demand," in *Issues in Physician Reimbursement*, N.T. Greenspan (ed.), HCFA, 1981, pp. 115-134, with Robert Woodward.

"Paying the Doctor: A Model of Work-Leisure Decisions under Alternative Remunerations," *Proceedings of the American Statistical Association*, 1979, with Robert Woodward.

Vertical Control of Markets: Business and Labor Practices. Ballinger Publishing Company, Cambridge, Mass., 1978.

"Vertical Control by Labor Unions," *American Economic Review*, 67 (June 1977), pp. 309-322. Reprinted as Publication Number 17, Center for the Study of American Business, November 1977.

"Vertical Control with Variable Proportions," *Journal of Political Economy*, 82 (July - August 1974), pp. 783-802.

Preliminary Survey of Jamaican Management Manpower: Resources and Requirements. Jamaican Institute of Management, 1969.

Conference, Seminar, Working and Discussion Papers

"Congestion Pricing at Airports," ACI-NA 11th Annual Conference, Salt Lake City, November 12, 2002; 2001 FAA Commercial Aviation Forecast Conference, Washington, D.C., March 14, 2001; ACI-NA 9th Annual Conference, New York City, October 3, 2000.

FTC Workshop: Competition Policy in the World of B2B Electronic Marketplaces, June 30, 2000.

FTC Workshop: Slotting Allowances, June 1, 2000.

"Consumers, Consolidation, and Concentration: Policy Issues,": at the ERS of the USDA conference, The American Consumer and the Changing Structure of Food System, May 4, 2000.

"Design and Implementation of Competition Law and Policy" and "Mergers, Acquisitions and Other Structural Arrangements." Competition Law and Policy: Cross-country Approaches & Experiences. World Bank Institute, Singapore Trade Development Board, and Organization for Economic Co-operation and Development May 14-May 20, 2000.

"The Case Against an Agrarian Antitrust Policy," 2000 USDA Agriculture Outlook Forum. February 24, 2000.

"Proving Damages in a Business Case," Business Litigation Seminar, Business Law Section of the Florida Bar, November 20 (Tampa) - 21 (Miami), 1997.

"Basic Economics for Lawyers," Section of Antitrust Law, American Bar Association, New York, N.Y., October 3-4, 1996.

"Vertical Control in the Entertainment Industry," Chair's Showcase Program: The Integration, Disintegration and Reintegration of the Entertainment Industry, American Bar Association, Section of Antitrust Law, 44th Annual Antitrust Spring Meeting, Washington D.C., March 28, 1996.

"Privatization and Regulation in the Restructuring of Electric Utilities in Eastern Europe," IBRD Conference on the Privatization of Electric Utilities, Prague, The Czech Republic, September 1993.

"Implications of the United States Experience with Regulation and Antitrust for Competition Policy in Countries in Transition from Centrally Planned Economies to Market Economies," IBRD/EDI/USAID Seminar on Microeconomics, Vienna, Austria, July 1993.

"The Economics of Punitive Damages." Punitive Damages after TXO: American Bar Association Antitrust Section Meeting, New York, August, 1993.

"Regulatory Alternatives for FERC Following the Energy Policy Act of 1992," The Federal Energy Bar Association Mid-Year Meeting, Washington, D.C., November 19, 1992.

"The Economics of Credit Card Interest Rate Caps," Seminars at the Economic Analysis Group, U.S. Department of Justice, September 29, 1992; the Board of Governors of the Federal Reserve System, October 7, 1992; and the D.C. Bar Association, November 19, 1992.

"Straws in the Bottleneck: A Proposal for Efficient Network Interconnection," presented at the Tenth Biennial Conference of the International Telecommunications

Society, Cannes, France, June 1992; *Journal of Regulatory Economics* Editors' Conference, San Diego, October 1992, with John Woodbury and Glenn Woroch.

"Economic Principles of Penalties for Antitrust Violations, and the Role of the Economist in Corporate Sentencing," Corporate Sentencing Under the Federal Sentencing Guidelines for An Antitrust Defendant, The Federal Bar Association, Antitrust and Trade Regulation Section, May 1992.

"The State of Antitrust in 1991: A Kindler, Gentler Antitrust?," The CATO Institute Conference, 1991, with Steve Calkins.

"Economic Analysis and Policy Implications of the Financial Interest and Syndication Rule," Telecommunications Policy Research Conference, October 1990, with John Woodbury.

"The Design and Evaluation of Competitive Rules Joint Ventures for Mergers and Natural Monopolies," American Enterprise Institute conference on Policy Approaches to the Deregulation of Network Industries, October 1990, and at the American Economic Association Meetings, December 1989, with John Woodbury.

"Regulation and the Partially Monopolized Network: Lessons from Telecommunications," American Enterprise Institute conference on Policy Approaches to the Deregulation of Network Industries, October 1990, with Roger Noll.

"Price Regulation and Common Carrier Regulation," AEI Conference on Oil Pipeline Deregulation, American Enterprise Institute.

"Regulation of New Crude-Oil Pipelines: Natural Monopoly and Information Externalities," AEI Conference on Oil Pipeline Deregulation, American Enterprise Institute.

"Economic Theory as the Missing Link in the Merger Guidelines," American Bar Association Antitrust Section Spring Meeting, March 1990.

"Testing the Structure-Competition Relationship on Cross-Sectional Firm Data," *Economic Analysis Group Discussion Paper* #88-6, May 1988, and at the Southern Economic Association Meetings, November 1986, with Donald M. Brown.

"Deterring Criminal Antitrust Behavior: Sanctions versus Structure," Stanford University Conference, June 1987.

"Deregulation of Electric Power Generation," New Mexico State University Conference, September 1986, and Edison Electric Institute, April 1987.

"Do Successful Tender Offers Benefit Bondholders?" Southern Economic Association Meetings, November 1986, with Catherine Benham, Donald M. Brown and Susan E. Woodward.

"Professional Ethics and Financial Incentives: 'Appropriate' Medical Care," *Washington University Department of Economics Working Paper #40*, May 1982, with Robert Woodward.

"Hospital Care Expenditure Inflation: Crisis or Consumption?" *Washington University Department of Economics Working Paper #43*, December 1982, with Robert Woodward and Walter Chien.

"Transfer Pricing within U.S. Corporations," Sixth U.S.-Soviet Economic Symposium; Alma-Ata, Kazakhstan, U.S.S.R., May - June, 1981.

"The Impact of Automobile Mileage Standards," Western Economic Association Meetings, 1979, with Michael Smirlock.

"The Effect of Factor-Augmenting Technical Change on Factory Demand, and the Response by Factor

Suppliers," Western Economic Association Meetings, October 1977.

"Vertical Integration in Telecommunications," Telecommunications Policy Research Conference, April 1974.

Other Papers

Brief Amicus Curiae of Economics Professors and Scholars in Support of Respondent, Supreme Court of the United States, *Lotus Development Corp. v. Borland International, Inc.*, No. 94-2003, December 1995.

"Implementing Competitive Rules Joint Ventures for Railroads," IBRD (World Bank), April, 1995.

"Critical Loss and Critical Elasticity: Their Derivation and Use in Market Definition for Mergers," November 1994.

"When Nominally Monopolistically-Competitive Firms are Really Perfectly Competitive: Going First-Class on the Paris Metro," July 1986.

"Mandatory Energy Performance Standards and Residential Energy Demand," 1981, with Alan Rockwood and Richard Adams.

"The Effects of Endogenous Quality Change on Demand and Costs," October 1977.

Testimony, Commissioned Studies, and Government Consulting

Six West Retail Acquisition Inc.: *Six West Retail Acquisition, Inc. v. Sony Theater Management Corporation et. al.*, U.S. District Court, Southern District on New York, 97 Civ. 5499 (LAP) (JCF). Expert Report, December 23, 2002; Rebuttal Report, February 19, 2003, Deposition, February 25, 2003.

In Re. Microsoft Corp. Antitrust Litigation: U.S. District Court, District of Maryland, MDL Docket No. 1332,

Liability Report, August 26, 2002, Rebuttal Report, November 4, 2002, Deposition, February 20-21, 2003.

Brown & Williamson Tobacco Corporation: Declaration of Frederick R. Warren-Boulton, in *R.J. Reynolds Tobacco Company v. Philip Morris, Inc., Lorillard Tobacco Company v. Philip Morris, Inc., Brown & Williamson Tobacco Corp., v. Philip Morris, Inc.*, U.S. District Court, Middle District of North Carolina. Civil Action Nos. 1:99CV185, 1:99CV207, and 1:99CV232.

Menasha Corporation: Expert and supplemental report in *Menasha Corporation v. News America Marketing In-Store, et al.*, U.S. District Court, Northeastern District of Illinois Eastern Division, Civil Action No. 00C-1895.

Power Mosfet Technologies, L.L.C. Expert witness in *Power Mosfet Technologies, L.L.C. vs. Infineon Technologies Corp., et al.*, U.S. District Court, Eastern District of Texas, Marshall Division, Cause No. 2-99-CV00168-DF. Expert Report; Deposition August 11, 2001; Trial testimony August 29, 2001.

Southwest Recreational Industries: Expert witness in *Southwest Recreational Industries v. FieldTurf, Inc.* Trial testimony November 28, 2000.

Anthony D. Viazis: Expert witness in *Anthony D. Viazis v. American Association of Orthodontists*. U.S. District Court, Eastern District of Texas, Sherman Division. Civil Action No. 4:98-CV-245, Expert report (with David Eisenstadt), July 13, 2000. Trial testimony November 9, 2000.

Ventana Medical Systems: Report and testimony, Department of Energy, March 8, 2000.

State of Alaska: Testimony before State legislature on the acquisition of ARCO by BP, January 19, 2000.

State of New York, et al., and U.S. Department of Justice: Expert witness in *United States of America v. Microsoft Corporation, and State of New York ex rel. v. Microsoft Corporation*. C.A. No. 98-1232 (TPJ) and CA. No. 98-1233 (TTPJ). Declaration May 15, 1998, Report September 3, 1998, Deposition September 26, 1998, Direct Testimony and Trial Testimony November 19 - December 1, 1998.

Brunswick Corporation: Expert witness in *Concord Boat Co. et al. v. Brunswick Corporation*. U.S. District Court, Eastern District of Arkansas, Western Division. Trial testimony June 11, 1998. Depositions February 2-4, 1998.

Bepco, Inc.: Deposition in *Bepco, Inc. et al. v. Allied Signal, Inc. and Allied Signal Truck Brake System Company*, U.S. District Court for the Middle District of North Carolina Winston-Salem Division. C.A. No. 6:96CV00274, November 25-26, 1998.

St. Louis Convention and Visitors Commission: Declaration in *St. Louis Convention and Visitors Commission v. National Football League, et al.*; U.S. District Court, Eastern District of Missouri, Eastern Division, C.A. No. 4:95CV02443 JCH, September 12, 1997.

AT&T: (a) Direct testimony and deposition in *State of Indiana, Indiana Utility Regulatory Commission*, Cause No. 397051994, April 1994; (b) Position paper on Docket No. 94-07-02: Development of the Assumptions, Tests, Analysis and Review to Govern Telecommunications Service Reclassifications in Light of the 8 Criteria Set Forth in Section 8 of Public Act 94-83. *State Of Connecticut, Department of Public Utility Control*, October 1994; (c) Comments on the Position Papers on Docket No. 94-07-02. *State Of Connecticut, Department of Public Utility Control*, November 1994; (d) Rebuttal Testimony in *Kansas Corporation*

Commission Docket No. 190, 492-U, July 15, 1996; (e) Direct and Rebuttal Testimony in *AT&T Communications of the Southwest Inc.*, Missouri Case No. TO-97-40; (f) Direct testimony in *Southwestern Bell Telephone Company of Kansas' Compliance with Section 271 of the Federal Telecommunications of 1996*, The State Corporation Commission of the State of Kansas. Docket No. 97-SWBT-411-GIT, May 12, 1998; (g) *Application of Ernest G. Johnson, Director of the Public Utility Division Oklahoma Corporation Commission to Explore The Requirements of Section 271 of the Telecommunications Act of 1996*, Cause No. PUD 970000064; (h) Declaration in *Implementation of the Pay Telephone Reclassification and Compensation Provisions of the Telecommunications Act 1996*, Federal Communications Commission, CC Docket No. 96-128, September 9, 1997; (i)Testimony in *MGC Communications, Inc. v. AT&T Corporation*, Federal Communications Commission: trial testimony June 28, 1999; (j) Testimony in *Fibercomm, L.C., et al v. AT&T Communications of the Midwest, Inc.*, before the Iowa Utilities Board, December 20, 2000; (k) Affidavit, supplemental affidavit and deposition in *AT&T Corporation v. Business Telecom, Inc.*, Federal Communication Commission. File No. EB-01-MD-002, January - March 2000; (l) Expert Report in Advamtel, LLC, et al, v. AT&T Corp.

Federal Trade Commission: (a) Study on Vertical Distribution Arrangements, January 1, 1977 - August 1, 1978; (b) Expert witness in *FTC v. Staples and Office Depot*; U.S. District Court, District of Columbia, Trial Testimony, May 1997.

Leo One USA: Affidavit in *Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-*

Voice, Non-Geostationary Mobile Satellite Service, FCC Docket No. 96-220, December 20, 1996.

Florida Panthers Hockey Club: Expert witness in *Florida Panthers Hockey Club v. Miami Sports and Exhibition Authority and The City of Miami*; U.S. District Court, Southern District of Florida Miami Division; Case No. 96-21 68-CIV. Trial Testimony, August, 1996.

ADM: "An Evaluation of: The Cost to U.S. Animal-Feed Manufactures of an Alleged Price-Fixing Conspiracy by Lysine Manufactures 1992-1995," August 1996.

MCI: (a) "Depreciation and Capital Recovery Issues, A Response to Professor Hausman," with K. Baseman and S. Woodward, FCC Docket No. 96-98, July 1996; (b) Direct testimony in Southwestern Bell Telephone Company of Kansas' Compliance with Section 271 of the Federal Telecommunications of 1996, The State Corporation Commission of the State of Kansas. Docket No. 97-SWBT-411-GIT, May 12, 1998; (c) Declaration in *Application of BellSouth Corporation, BellSouth Telecommunications, Inc. and BellSouth Long Distance, Inc. for Provision of In-Region, InterLATA Services in South Carolina.* FCC Docket No. 97-208, October 17, 1997 (with Kenneth C. Baseman); (d) Declaration and supplemental declaration in *Joint Applications of MCI WorldCom, Inc. and Sprint Corporation for Consent to Transfer Control*, CC Docket No. 99-333, March 2000 and June 2000.

K-2, Rossignol, Salomon, Tecnica, Skis Dynastar, Marker and The Ski Market: Expert witness in *Sports Investment Co. vs. The Ski Market, Ltd., Inc., et al.*, U.S. District Court, District of Rhode Island, C.A. No. 95-097T. Deposition, December 1995.

U.S. Department of Justice, Antitrust Division: (a) Expert witness in *U.S. v. AT&T*, 1981; (b) Regulation of oil pipelines, August 1983; (c) Expert witness in *United*

States of America v. Engelhard Corporation, Floridin Company, U.S. Borax Inc., U.S. Silica Inc. Case No. 6:96-CV-45 (WLS), Depositions, Trial Testimony August 1995 (d) Declaration in *United States of America v. Dairy Farmer of America, Inc., et al.*

City of Los Angeles: Declaration in *Air Transport Association of America, et al., v. City of Los Angeles, City of Los Angeles Department of Airports and Los Angeles Board of Airport Commissioners*, Docket No. 50176, March 1995, and Supplemental Declaration, April 1995.

The Bon-Ton Stores, Inc.: Declaration in *The Bon-Ton Stores, Inc. v. The May Department Stores Company, McCurdy & Company, Inc., and Wilmorite, Inc.*, Civil Action No. 94-CV-6454L, November 1994.

Cyrix Corporation: Deposition in *Cyrix Corporation v. Intel Corporation*, December 1993.

Thermadyne Industries: Deposition in *Thermadyne Industries, Inc. and Coyne Cylinder Co. v. K.C. Cylinder et al.*, December 1993.

IBRD (World Bank): (a) Privatization and Regulation in the Restructuring of Electric Utilities in Eastern Europe, Prague, September 1993; (b) Implications of the United States Experience with Regulation and Antitrust for Competition Policy in Countries in Transition from Centrally Planned Economies to Market Economies, July 1993.

Credit Card Coalition: "The Economics of Credit Card Interest Rate Caps," 1993, with Laurence H. Meyer.

Coalition to Preserve the Financial Interest and Syndication Rule: (a) Testimony before the Federal Communications Commission, December 7, 1990, in the matter of *Evaluation of the Syndication and Financial Interest Rules*, MM Docket No. 90-162; (b) Submitted reports: "Economic Analysis and Policy Implications of the

Financial Interest and Syndication Rule," June 14, 1990; "Reply Comments," August 1, 1990; "Economic Analysis and Policy Implications of the Financial Interest and Syndication Rule," January 24, 1991, with John Woodbury; (c) Declaration of Frederick R. Warren-Boulton, August 7, 1992, Exhibit 7, Comments of the Coalition to Preserve the Financial Interest and Syndication Rule on Proposed Modification of Network Consent Decrees. In *United States of America v. CBS, Inc.* Civil No. 74-3599-RJK, *United States of America v. American Broadcasting Companies, Inc.* Civil No. 74-3600-RJK, and *United States of America v. National Broadcasting Company, Inc.* Civil No. 74-3601-RJK.

California Public Utility Commission, Division of Ratepayer Advocacy: Proposed merger of Southern California Edison Company and San Diego Gas and Electric Company, July 1990.

Altai, Inc.: Expert witness in *Computer Associates, Inc. v. Altai, Inc.*, April 1990.

NFL Players Association: Deposition in *Marvin Powell v. National Football League*, September 1989.

Consolidated Aluminum Corporation: Deposition in *Indal, Inc. v. Consolidated Aluminum Corp.*, April 1983.

Battelle, Pacific Northwest Laboratories. Analyses of bidding for offshore oil leases and of the effects of Building Energy Performance Standards on energy demand, September 1979 -1981.

U.S. Senate Commerce Committee, Senator Danforth presiding: Testimony on corporate average fuel economy (CAFÉ) standards, November 15, 1979.

State of Missouri, Office of the Public Counsel: Expert witness on electric utility rate structures, 1978.

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Curriculum Vitae

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Education:

Ph.D. Economics,
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M.S. Operations Research,
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A.B. Mathematics,
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Professional Positions:

Professor of Economics and Public Affairs, Princeton University, 1978-.

Principal External Advisor, Infrastructure Program, Inter-American Development Bank, 6/97-8/98.

Deputy Assistant Attorney General, U.S. Department of Justice, 1989-91.

Supervisor, Economics Research Department, Bell Laboratories, 1977-78.

Visiting Lecturer (with rank of Associate Professor), Department of Economics and Woodrow Wilson School, Princeton University, 1977-78 (part time).

Economics Research Department, Bell Laboratories, 1973-77.

Lecturer, Economics Department, Stanford University, 1971-73.

Other Professional Activities:

Advisory Board, *Electronic Journal of Industrial Organization and Regulation Abstracts*, 1996-.

Visiting Faculty Member (occasional), International Program on Privatization and Regulatory Reform, Harvard Institute for International Development, 1996-2000.

Member, National Research Council Highway Cost Allocation Study Review Committee, 1995-98.

Member, Defense Science Board Task Force on the Antitrust Aspects of Defense Industry Consolidation, 1993-94.

Editorial Board, *Utilities Policy*, 1990-

Leif Johanson Lecturer, University of Oslo, November 1988.

Member, New Jersey Governor's Task Force on Market-Based Pricing of Electricity, 1987-1989.

Co-editor, *Handbook of Industrial Organization*, 1984-89.

Associate Editor, *Journal of Industrial Economics*, 1984-89.

Director, Consultants in Industry Economics, Inc., 1983-89, 1991-94.

Fellow, Econometric Society, 1981-.

Organizing Committee, Carnegie-Mellon-N.S.F. Conference on Regulation, 1985.

Board of Editors, *American Economic Review*, 1980-83.

Nominating Committee, American Economic Association, 1980-81.

Research Advisory Committee, American Enterprise Institute, 1980-86.

Editorial Board, M.I.T. Press Series on Government Regulation of Economic Activity, 1979-93.

Program Committee, 1980 World Congress of the Econometric Society.

Program Committee, Econometric Society, 1979, 1981, 1985.

Organizer, American Economic Association Meetings: 1980, 1982.

American Bar Association Section 7 Clayton Act Committee, 1981.

Principal Investigator, NSF grant SOC79-0327, 1979-80; NSF grant 285-6041, 1980-82; NSF grant SES-8038866, 1983-84, 1985-86.

Aspen Task Force on the Future of the Postal Service, 1978-80.

Organizing Committee of Sixth Annual Telecommunications Policy Research Conference, 1977-78.

Visiting Fellow, University of Warwick, July 1977.

Institute for Mathematical Studies in the Social Sciences, Stanford University, 1975.

Consulting: Bell Laboratories, 1978-79; AT&T, 1978-89, 1991-; Conrail 1978-87, 1991-97; Federal Trade Commission, 1979-82, 1994-96; Pennsylvania Bell, 1980; Simpson Thatcher Bartlett, 1980, 1993-98; American Association of Railroads, 1981, 1985; Math-tech, 1981; Union Pacific Railroad, 1981, 1995-99; Family Lines Rail System, 1982; Pepper, Hamilton, and Scheetz, 1981-87, 1991-98, 2001; Siemens Corp., 1982; Board of Governors of U. S. Postal Service, 1981; OECD, 1983-85, 1991-95; Sidley & Austin, 1983-89, 1991-; U.S. Postal Service, 1983-84; Echlin Inc., 1982-83; United Airlines, 1983, 1991-98; Consultants in Industry Economics, 1983-89, 1991-; Wiley, Malehorn & Sirota, 1983-89; City of Newark, 1984; Arnold & Porter, 1986-89, 1991-2000; Howrey & Simon, 1985-88, 1993-;

Kodak, 1987-89; Crowell & Moring, 1988; Viacom 1989, 1991-98; Bell Atlantic, 1991-94; Intel, 1991-93; AOPL, 1993; IBM, 1993-96; Merck, 1993-95; Harkins Cunningham, 1993-96; Boeing, 1993-98; Niagra Mohawk, 1994; PSE&G, 1994-96; Microsoft, 1994; Coca-Cola Co., 1994-2001; Digital Equipment Corp. 1997-98; World Bank 1994-98; Inter-American Development Bank, 1997-2000; Steptoe & Johnson, 1997-; Air Transport Association of America, 1998; American Electric Power, 1999-2001; Cravath, Swaine & Moore, 1998-; Skadden Arps, 1999-2001; Amgen, 2000-02; Comcast, 2000; Williams & Connolly, 2000; New Power Corporation, 2001. Freddie Mac, 2002.

Published Articles and Book Chapters:

"Practical Rules for Pricing Access in Telecommunications," (with J. Ordover) in *Second Generation Reforms in Infrastructure Services*, F. Basanes and R. Willig (eds.), Johns Hopkins Press, 2002.

"Comments on Antitrust Policy in the Clinton Administration," in *American Economic Policy in the 1990s*, J. Frankel and P. Orszag (eds.), MIT Press, 2002.

"Entrepreneurship, Access Policy and Economic Development: Lessons from Industrial Organization," (with M. Dutz and J. Ordover), *European Economic Review*, (44)4-6 (2000), pp. 739-747.

"Public Versus Regulated Private Enterprise," reprinted in *Privatization in Developing Countries*, P. Cook and C. Kirkpatrick (eds.), Edward Elgar, 2000.

"Consumer's Surplus Without Apology," reprinted in *Readings in Social Welfare: Theory and Policy*, Robert E. Kuenne (ed.), Blackwell, 2000, pp. 86-97; reprinted in *Readings in Microeconomic Theory*, M. M. La Manna (ed.), Dryden Press, 1997, pp. 201-212.

"Pareto Superior Nonlinear Outlay Schedules," reprinted in *The Economics of Price Discrimination*, G. Norman, (ed.), Edward Elgar, 1999.

"Deregulation v. the Legal Culture: Panel Discussion," in *Is the Telecommunications Act of 1996 Broken?*, G. Sidak (ed.), AEI Press, 1999.

"Economic Principles to Guide Post-Privatization Governance," in *Can Privatization Deliver? Infrastructure for Latin America*, R. Willig co-editor, Johns Hopkins Press, 1999.

"Access and Bundling in High-Technology Markets," (with J. A. Ordover), in *Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital Marketplace*, J. A. Eisenach and T. Lenard (eds.), Kluwer, 1999.

"Competitive Rail Regulation Rules: Should Price Ceilings Constrain Final Products or Inputs?," (With W. J. Baumol), *Journal of Transport Economics and Policy*, Vol. 33, Part 1, pp. 1-11.

"Economic Effects of Antidumping Policy," *Brookings Trade Forum: 1998*, 19-41.

"Interview With Economist Robert D. Willig," *Antitrust*, Vol. 11, No. 2, Spring 1997, pp.11-15.

"Parity Pricing and its Critics: A Necessary Condition for Efficiency in Provision of Bottleneck Services to Competitors," (with W. J. Baumol and J. A. Ordover), *Yale Journal on Regulation*, Vol. 14, No. 1, Winter 1997, pp. 145-164.

"Restructuring Regulation of the Rail Industry," (with Ioannis Kessides), in *Private Sector*, Quarterly No. 4, September 1995, pp. 5-8. Reprinted in *Viewpoint*, October, 1995, The World Bank. Reprinted in *Private Sector, special edition: Infrastructure*, June 1996.

"Competition and Regulation in the Railroad Industry," (with Ioannis Kessides), in *Regulatory Policies and Reform: A Comparative Perspective*, C. Frischtak (ed.), World Bank, 1996.

"Economic Rationales for the Scope of Privatization," (with Carl Shapiro), reprinted in *The Political Economy of Privatization and Deregulation*, E. E. Bailey and J. R. Pack (eds.), The International Library of Critical Writings in Economics, Edward Elgar Publishing Co., 1995, pp. 95-130.

"Weak Invisible Hand Theorems on the Sustainability of Multi-product Natural Monopoly," (with W. Baumol and E. Bailey), reprinted in *The Political Economy of Privatization and Deregulation*, E. E. Bailey and J. R. Pack (eds.), The International Library of Critical Writings in Economics, Edward Elgar Publishing Co., 1995, pp. 245-260.

"Economists' View: The Department of Justice Draft Guidelines for the Licensing and Acquisition of Intellectual Property," (with J. Ordover), *Antitrust*, Vol. 9, No. 2 (spring 1995), 29-36.

"Public Versus Regulated Private Enterprise," in *Proceedings of the World Bank Annual Conference on Development Economics 1993*, L. Summers (ed.), The World Bank, 1994.

"Economics and the 1992 Merger Guidelines: A Brief Survey," (with J. Ordover), *Review of Industrial Organization*, Vol. 8, No. 2, (1993), pp. 139-150.

"The Role of Sunk Costs in the 1992 Guidelines' Entry Analysis," *Antitrust*, Vol. 6, No. 3 (summer 1992).

"Antitrust Lessons from the Airlines Industry: The DOJ Experience," *Antitrust Law Journal*, Vol. 60, No. 2 (1992).

"William J. Baumol," (with E. E. Bailey), in *New Horizons in Economic Thought: Appraisals of Leading Economists*, W. J. Samuels (ed.), Edward Elgar, 1992.

"Anti-Monopoly Policies and Institutions," in *The Emergence of Market Economies in Eastern Europe*, Christopher Clague and Gordon Rausser (eds.), Basil Blackwell, 1992.

"Economics and the 1992 Merger Guidelines," (with Janusz Ordover), in *Collaborations Among Competitors: Antitrust Policy and Economics*, Eleanor Fox and James Halverson (eds.), American Bar Association, 1992.

"On the Antitrust Treatment of Production Joint Ventures," (with Carl Shapiro), reprinted in *Collaborations Among Competitors: Antitrust Policy and Economics*, Eleanor Fox and James Halverson (eds), American Bar Association, 1992.

"Merger Analysis, Industrial Organization Theory, and Merger Guidelines," *Brookings Papers on Economic Activity – Microeconomics 1991*, pp. 281-332.

"On the Antitrust Treatment of Production Joint Ventures," (with C. Shapiro), *Journal of Economic Perspectives*, Vol. 4, No. 3, Summer 1990, pp. 113-130.

"Economic Rationales for the Scope of Privatization," (with Carl Shapiro), in *The Political Economy of Public Sector Reform and Privatization*, E.N. Suleiman and J. Waterbury (eds), Westview Press, Inc., 1990, pp. 55-87.

"Contestable Market Theory and Regulatory Reform," in *Telecommunications Deregulation: Market Power and Cost Allocation*, J.R. Allison and D.L. Thomas (eds.), Ballinger, 1990.

"Address To The Section," *Antitrust Law Section Symposium*, New York State Bar Association, 1990.

"Price Caps: A Rational Means to Protect Telecommunications Consumers and Competition," (with W. Baumol), *Review of Business*, Vol. 10, No. 4, Spring 1989, pp. 3-8.

"U.S.-Japanese VER: A Case Study from a Competition Policy Perspective," (with M. Dutz) in *The Costs of Restricting Imports, The Automobile Industry*. OECD, 1988.

"Contestable Markets," in *The New Palgrave: A Dictionary of Economics*, J. Eatwell, M. Milgate, and P. Newman (eds.), 1987.

"Do Entry Conditions Vary Across Markets: Comments," *Brookings Papers on Economic Activity*, 3 - 1987, pp. 872-877.

"Railroad Deregulation: Using Competition as a Guide," (with W. Baumol), *Regulation*, January/February 1987, Vol. 11, No. 1, pp. 28-36.

"How Arbitrary is 'Arbitrary'? – or, Toward the Deserved Demise of Full Cost Allocation," (with W. Baumol and M. Koehn), *Public Utilities Fortnightly*, September 1987, Vol. 120, No. 5, pp. 16-22.

"Contestability: Developments Since the Book," (with W. Baumol), Oxford Economic Papers, December 1986, pp. 9-36.

"The Changing Economic Environment in Telecommunications: Technological Change and Deregulation," in *Proceedings from the Telecommunications Deregulation Forum*; Karl Eller Center; 1986.

"Perspectives on Mergers and World Competition," (with J. Ordover), in *Antitrust and Regulation*, R.E. Grieson (ed.), Lexington, 1986.

"On the Theory of Perfectly Contestable Markets," (with J. Panzar and W. Baumol), in *New Developments in The Analysis of Market Structure*, J. Stiglitz and F. Mathewson (eds.), MIT Press, 1986.

"InterLATA Capacity Growth and Market Competition," (with C. Shapiro), in *Telecommunications and Equity: Policy Research Issues*, J. Miller (ed.), North Holland, 1986.

"Corporate Governance and Market Structure," in *Economic Policy in Theory and Practice*, A. Razin and E. Sadka (eds.), Macmillan Press, 1986.

"Antitrust for High-Technology Industries: Assessing Research Joint Ventures and Mergers," (with J. Ordover), *Journal of Law and Economics*, Vol 28(2), May 1985, pp. 311-334.

"Non-Price Anticompetitive Behavior by Dominant Firms Toward the Producers of Complementary Products," (with J. Ordover and A. Sykes), in *Antitrust and Regulation*, F.M. Fisher (ed.), MIT Press, 1985.

"Telephones and Computers: The Costs of Artificial Separation," (with W. Baumol), *Regulation*, March/April 1985.

"Transfer Principles in Income Redistribution," (with P. Fishburn), *Journal of Public Economics*, 25 (1984), pp. 1-6.

"Market Structure and Government Intervention in Access Markets," in *Telecommunications Access and Public Policy*, A. Baughcam and G. Faulhaber (eds.), 1984.

"Pricing Issues in the Deregulation of Railroad Rates," (with W. Baumol), in *Economic Analysis of Regulated Markets: European and U. S. Perspectives*, J. Finsinger (ed.), 1983.

"Local Telephone Pricing in a Competitive Environment," (with J. Ordover), in *Telecommunications Regulation Today and Tomorrow*, E. Noam (ed.), Harcourt Brace Jovanovich, 1983.

"Economics and Postal Pricing Policy," (with B. Owen), in *The Future of the Postal Service*, J. Fleishman (ed.), Praeger, 1983.

"Selected Aspects of the Welfare Economics of Postal Pricing," in *Telecommunications Policy Annual*, Praeger, 1987.

"The Case for Freeing AT&T" (with M. Katz), *Regulation*, July-Aug. 1983, pp. 43-52.

"Predatory Systems Rivalry: A Reply" (with J. Ordover and A. Sykes), *Columbia Law Review*, Vol. 83, June 1983, pp. 1150-1166. Reprinted in *Corporate Counsel's Handbook - 1984*.

"Sector Differentiated Capital Taxation with Imperfect Competition and Interindustry Flows," *Journal of Public Economics*, Vol. 21, 1983.

"Contestable Markets: An Uprising in the Theory of Industry Structure: Reply," (with W.J. Baumol and J.C. Panzar), *American Economic Review*, Vol. 73, No. 3, June 1983, pp. 491-496.

"The 1982 Department of Justice Merger Guidelines: An Economic Assessment," (with J. Ordover), *California Law Review*, Vol. 71, No. 2, March 1983, pp. 535-574. Reprinted in *Antitrust Policy in Transition: The Convergence of Law and Economics*, E.M. Fox and J.T. Halverson (eds.), 1984.

"Intertemporal Failures of the Invisible Hand: Theory and Implications for International Market Dominance," (with W.J. Baumol), *Indian Economic Review*, Vol. XVI, Nos. 1 and 2, January-June 1981, pp. 1-12.

"Unfair International Trade Practices," (with J. Ordover and A. Sykes), *Journal of International Law and Politics*, Vol. 15, No. 2, winter 1983, pp. 323-337.

"Journals as Shared Goods: Reply," (with J. Ordover), *American Economic Review*, Vol. 72, No. 3, June 1982, pp. 603-607.

"Herfindahl Concentration, Rivalry, and Mergers," (with J. Ordover and A. Sykes), *Harvard Law Review*, Vol. 95, No. 8, June 1982, pp. 1857-1875.

"An Economic Definition of Predation: Pricing and Product Innovation," (with J. Ordover), *Yale Law Journal*, Vol. 90: 473, December 1981, pp. 1-44.

"Fixed Costs, Sunk Costs, Entry Barriers, and the Sustainability of Monopoly," (with W. Baumol), *Quarterly Journal of Economics*, Vol. 96, No. 3, August 1981, pp. 405-432.

"Social Welfare Dominance," *American Economic Review*, Vol. 71, No. 2, May 1981, pp. 200-204.

"Economies of Scope," (with J. Panzar), *American Economic Review*, Vol. 72, No. 2, May 1981, pp. 268-272.

"Income-Distribution Concerns in Regulatory Policymaking," (with E.E. Bailey) in *Studies in Public Regulation* (G. Fromm, ed.), MIT Press, Cambridge, 1981, pp. 79-118.

"An Economic Definition of Predatory Product Innovation," (with J. Ordover), in *Strategic Predation and Antitrust Analysis*, S. Salop (ed.), 1981.

"What Can Markets Control?" in *Perspectives on Postal Service Issues*, R. Sherman (ed.), American Enterprise Institute, 1980.

"Pricing Decisions and the Regulatory Process," in *Proceedings of the 1979 Rate Symposium on Problems of Regulated Industries*, University of Missouri-Columbia Extension Publications, 1980, pp. 379-388.

"The Theory of Network Access Pricing," in *Issues in Public Utility Regulation*, H.M. Trebing (ed.), MSU Public Utilities Papers, 1979.

"Customer Equity and Local Measured Service," in *Perspectives on Local Measured Service*, J. Baude, etal. (ed.), 1979, pp. 71-80.

"The Role of Information in Designing Social Policy Towards Externalities," (with J. Ordover), *Journal of Public Economics*, Vol. 12, 1979, pp. 271-299.

"Economies of Scale and the Profitability of Marginal-Cost Pricing: Reply," (with J. Panzar), *Quarterly Journal of Economics*, Vol. 93, No. 4, Novmber 1979, pp. 743-744.

"Theoretical Determinants of the Industrial Demand for Electricity by Time of Day," (with J. Panzar) *Journal of Econometrics*, Vol. 9, 1979, pp. 193-207.

"Industry Performance Gradient Indexes," (with R. Dansby), *American Economic Review*, Vol. 69, No. 3, June 1979, pp. 249-260.

"The Economic Gradient Method," (with E. Bailey), *American Economic Review*, Vol. 69, No. 2, May 1979, pp. 96-101.

"Multiproduct Technology and Market Structure," *American Economic Review*, Vol. 69, No. 2, May 1979, pp. 346-351.

"Consumer's Surplus Without Apology: Reply," *American Economic Review*, Vol. 69, No. 3, June 1979, pp. 469-474.

"Decisions with Estimation Uncertainty," (with R. Klein, D. Sibley, and L. Rafsky), *Econometrica*, Vol. 46, No. 6, November 1978, pp. 1363-1388.

"Incremental Consumer's Surplus and Hedonic Price Adjustment," *Journal of Economic Theory*, Vol. 17, No. 2, April 1978, pp. 227-253.

"Recent Theoretical Developments in Financial Theory: Discussion," *The Journal of Finance*, Vol. 33, No. 3, June 1978, pp. 792-794.

"The Optimal Provision of Journals Qua Sometimes Shared Goods," (with J. Ordover), *American Economic Review*, Vol. 68, No. 3, June 1978, pp. 324-338.

"On the Comparative Statics of a Competitive Industry With Infra-marginal Firms," (with J. Panzar), *American Economic Review*, Vol. 68, No. 3, June 1978, pp. 474-478.

"Pareto Superior Nonlinear Outlay Schedules," *Bell Journal of Economics*, Vol. 9, No. 1, Spring 1978, pp. 56-69.

"Predatoriness and Discriminatory Pricing," in *The Economics of Anti-Trust: Course of Study Materials*, American Law Institute-American Bar Association, 1978.

"Economies of Scale in Multi-Output Production," (with J. Panzar), *Quarterly Journal of Economics*, Vol. 91, No. 3, August 1977, pp. 481-494.

"Weak Invisible Hand Theorems on the Sustainability of Multi-product Natural Monopoly," (with W. Baumol and E. Bailey), *American Economic Review*, Vol. 67, No. 3, June 1977, pp. 350-365.

"Free Entry and the Sustainability of Natural Monopoly," (with J. Panzar), *Bell Journal of Economics*, Spring 1977, pp. 1-22.

"Risk Invariance and Ordinally Additive Utility Functions," *Econometrica*, Vol. 45, No. 3, April 1977, pp. 621-640.

"Ramsey-Optimal Pricing of Long Distance Telephone Services," (with E. Bailey), in *Pricing in Regulated Industries, Theory and Application*, J. Wenders (ed.), Mountain State Telephone and Telegraph Co., 1977, pp. 68-97.

"Network Externalities and Optimal Telecommunications Pricing: A Preliminary Sketch," (with R. Klein), in *Proceedings of Fifth Annual Telecommunications Policy Research Conference*, Vol. II, NTIS, 1977, pp. 475-505.

"Otsenka ekonomicheskoi effektivnosti proizvodstvennoi informatsii" ["The Evaluation of the Economic Benefits of Productive Information"] in *Doklady Sovetskikh i Amerikanskikh Spetsialistov Predstavlennye na Pervyi Sovetsko-Amerikanskii Simpozium po Ekonomicheskoi Effektivnosti Informat sionnogo Obsluzhivaniia* [*Papers of Soviet and American Specialists Presented at the First Soviet-American Symposium on Costs and Benefits of Information Services*], All Soviet Scientific Technical Information Center, Moscow, 1976.

"Vindication of a 'Common Mistake' in Welfare Economics," (with J. Panzar), *Journal of Political Economy*, Vol. 84, No. 6, December 1976, pp. 1361-1364.

"Consumer's Surplus Without Apology," *American Economic Review*, Vol. 66, No. 4, September 1976, pp. 589-597.

Books:

Second Generation Reforms in Infrastructure Services, F. Basanes and R. Willig (eds.), Johns Hopkins Press, 2002.

Can Privatization Deliver? Infrastructure for Latin America, R. Willig co-editor, Johns Hopkins Press, 1999.

Handbook of Industrial Organization, (edited with R. Schmalensee), North Holland Press, Vols. 1 and 2, 1989.

Contestable Markets and the Theory of Industry Structure, (with W.J. Baumol and J.C. Panzar), Harcourt Brace Jovanovich, 1982. Second Edition, 1989.

Welfare Analysis of Policies Affecting Prices and Products, Garland Press, 1980.

Unpublished Papers and Reports:

"Stimulating Investment and the Telecommunications Act of 1996," (with J. Bigelow, W. Lehr and S. Levinson), 2002.

"An Economic Analysis of Spectrum Allocation and Advanced Wireless Services," (with Martin N. Baily, Peter R. Orszag, and Jonathan M. Orszag), 2002

"Effective Deregulation of Residential Electric Service," 2001

"Anticompetitive Forced Rail Access," (with W. J. Baumol), 2000

"The Risk of Contagion from Multi-Market Contact" (with Charles Thomas), 2000

"The Scope of Competition in Telecommunications" (with B. Douglas Bernheim), 1998

"Why Do Christie and Schultz Infer Collusion From Their Data?" (with Alan Kleidon), 1995.

"Demonopolization," (with Sally Van Siclen), OECD Vienna Seminar Paper, 1993.

"Economic Analysis of Section 337: The Balance Between Intellectual Property Protection and Protectionism," (with J. Ordover) 1990.

"The Effects of Capped NTS Charges on Long Distance Competition," (with M. Katz).

"Discussion of Regulatory Mechanism Design in the Presence of Research Innovation, and Spillover Effects," 1987.

"Industry Economic Analysis in the Legal Arena," 1987.

"Deregulation of Long Distance Telephone Services: A Public Interest Assessment," (with M. Katz).

"Competition-Related Trade Issues," report prepared for OECD.

"Herfindahl Concentration Index," (with J. Ordover), Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, March 1981.

"Market Power and Market Definition," (with J. Ordover), Memorandum for ABA Section 7 Clayton Act Committee, Project on Revising the Merger Guidelines, May 1981.

"The Continuing Need for and National Benefits Derived from the REA Telephone Loan Programs - An Economic Assessment," 1981.

"The Economics of Equipment Leasing: Costing and Pricing," 1980.

"Rail Deregulation and the Financial Problems of the U.S. Railroad Industry," (with W.J. Baumol), report prepared under contract to Conrail, 1979.

"Price Indexes and Intertemporal Welfare," Bell Laboratories Economics Discussion Paper, 1974.

"Consumer's Surplus: A Rigorous Cookbook," Technical Report #98, Economics Series, I.M.S.S.S., Stanford University, 1973.

"An Economic-Demographic Model of the Housing Sector," (with B. Hickman and M. Hinz), Center for Research in Economic Growth, Stanford University, 1973.

Invited Conference Presentations:

ABA Section of Antitrust Law 2002 Fall Forum
"Competition, Regulation and Pharmaceuticals" 2002

Fordham Conference on International Antitrust Law and Policy
"Substantive Standards for Mergers and the Role of Efficiencies" 2002

Department of Justice Telecom Workshop
"Stimulating Investment and the Telecommunications Act of 1996" 2002

Department of Commerce Conference on the State of the Telecom Sector
"Stimulating Investment and the Telecommunications Act of 1996" 2002

Law and Public Affairs Conference on the Future of Internet Regulation
"Open Access and Competition Policy Principles" 2002

Center for Economic Policy Studies Symposium on Energy Policy
"The Future of Power Supply" 2002

The Conference Board: Antitrust Issues in Today's Economy
"The 1982 Merger Guidelines at 20" 2002

Federal Energy Regulatory Commission Workshop
"Effective Deregulation of Residential Electric Service" 2001

IPEA International Seminar on Regulation and Competition
"Electricity Markets: Deregulation of Residential Service" 2001
"Lessons for Brazil from Abroad" 2001

ABA Antitrust Law Section Task Force Conference
"Time, Change, and Materiality for Monopolization Analyses" 2001

Harvard University Conference on American Economic Policy in the 1990s
"Comments on Antitrust Policy in the Clinton Administration" 2001

Tel-Aviv Workshop on Industrial Organization and Anti-Trust
"The Risk of Contagion from Multimarket Contact" 2001

2001 Antitrust Conference
"Collusion Cases: Cutting Edge or Over the Edge?" 2001
"Dys-regulation of California Electricity" 2001

FTC Public Workshop on Competition Policy for E-Commerce
"Necessary Conditions for Cooperation to be Problematic" 2001

HIID International Workshop on Infrastructure Policy
"Infrastructure Privatization and Regulation" 2000

Villa Mondragone International Economic Seminar
"Competition Policy for Network and Internet Markets" 2000

New Developments in Railroad Economics: Infrastructure Investment and Access Policies
"Railroad Access, Regulation, and Market Structure" 2000

The Multilateral Trading System at the Millennium
"Efficiency Gains From Further Liberalization" 2000

Singapore – World Bank Symposium on Competition Law and Policy
"Policy Towards Cartels and Collusion" 2000

CEPS: Is It a New World?: Economic Surprises of the Last Decade
"The Internet and E-Commerce" 2000

Cutting Edge Antitrust: Issues and Enforcement Policies
"The Direction of Antitrust Entering the New Millennium" 2000

The Conference Board: Antitrust Issues in Today's Economy
"Antitrust Analysis of Industries With Network Effects" 1999

CEPS: New Directions in Antitrust
"Antitrust in a High-Tech World" 1999

World Bank Meeting on Competition and Regulatory Policies for Development
"Economic Principles to Guide Post-Privatization Governance" 1999

1999 Antitrust Conference
"Antitrust and the Pace of Technological Development" 1999
"Restructuring the Electric Utility Industry" 1999

HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance
"Privatization and Post-Privatization Regulation of Natural Monopolies" 1999

The Federalist Society: Telecommunications Deregulation: Promises Made, Potential Lost?
"Grading the Regulators" 1999

Inter-American Development Bank: Second Generation Issues In the Reform Of Public Services
"Post-Privatization Governance" 1999
"Issues Surrounding Access Arrangements" 1999

Economic Development Institute of the World Bank – Program on Competition Policy
"Policy Towards Horizontal Mergers" 1998

Twenty-fifth Anniversary Seminar for the Economic Analysis Group of the Department of Justice
"Market Definition in Antitrust Analysis" 1998

HIID International Workshop on Privatization, Regulatory Reform and Corporate Governance
"Infrastructure Architecture and Regulation: Railroads" 1998

EU Committee Competition Conference – Market Power
"US/EC Perspective on Market Definition" 1998

Federal Trade Commission Roundtable
"Antitrust Policy for Joint Ventures" 1998

1998 Antitrust Conference
"Communications Mergers" 1998

The Progress and Freedom Foundation Conference on Competition, Convergence, and the Microsoft Monopoly
"Access and Bundling in High-Technology Markets" 1998

FTC Program on The Effective Integration of Economic Analysis into Antitrust Litigation
"The Role of Economic Evidence and Testimony" 1997

FTC Hearings on Classical Market Power in Joint Ventures
"Microeconomic Analysis and Guideline" 1997

World Bank Economists – Week IV Keynote
"Making Markets More Effective With Competition Policy" 1997

Brookings Trade Policy Forum
"Competition Policy and Antidumping: The Economic Effects" 1997

University of Malaya and Harvard University Conference on The Impact of Globalisation and Privatisation on Malaysia and Asia in the Year 2020
"Microeconomics, Privatization, and Vertical Integration" 1997

ABA Section of Antitrust Law Conference on The Telecommunications Industry
"Current Economic Issues in Telecommunications" 1997

Antitrust 1998: The Annual Briefing
"The Re-Emergence of Distribution Issues" 1997

Inter-American Development Bank Conference on Private Investment, Infrastructure Reform and Governance in Latin America & the Caribbean
"Economic Principles to Guide Post-Privatization Governance" 1997

Harvard Forum on Regulatory Reform and Privatization of Telecommunications in the Middle East
"Privatization: Methods and Pricing Issues" 1997

American Enterprise Institute for Public Policy Research Conference
"Discussion of Local Competition and Legal Culture" 1997

Harvard Program on Global Reform and Privatization of Public Enterprises
"Infrastructure Privatization and Regulation: Freight" 1997

World Bank Competition Policy Workshop
"Competition Policy for Entrepreneurship and Growth" 1997

Eastern Economics Association Paul Samuelson Lecture
"Bottleneck Access in Regulation and Competition Policy" 1997

ABA Annual Meeting, Section of Antitrust Law
"Antitrust in the 21st Century: The Efficiencies Guidelines" 1997

Peruvian Ministry of Energy and Mines Conference on Regulation of Public Utilities
"Regulation: Theoretical Context and Advantages vs. Disadvantages" 1997

The FCC: New Priorities and Future Directions
"Competition in the Telecommunications Industry" 1997

American Enterprise Institute Studies in Telecommunications Deregulation
"The Scope of Competition in Telecommunications" 1996

George Mason Law Review Symposium on Antitrust in the Information Revolution
"Introduction to the Economic Theory of Antitrust and Information" 1996

Korean Telecommunications Public Lecture
"Market Opening and Fair Competition" 1996

Korea Telecommunications Forum
"Desirable Interconnection Policy in a Competitive Market" 1996

European Association for Research in Industrial Economics Annual Conference
"Bottleneck Access: Regulation and Competition Policy" 1996

Harvard Program on Global Reform and Privatization of Public Enterprises
"Railroad and Other Infrastructure Privatization" 1996

FCC Forum on Antitrust and Economic Issues Involved with InterLATA Entry
"The Scope of Telecommunications Competition" 1996

Citizens for a Sound Economy Policy Watch on Telecommunications Interconnection
"The Economics of Interconnection" 1996

World Bank Seminar on Experiences with Corporatization
"Strategic Directions of Privatization" 1996

FCC Economic Forum on the Economics of Interconnection
"Lessons from Other Industries" 1996

ABA Annual Meeting, Section of Antitrust Law
"The Integration, Disintegration, and Reintegration of the Entertainment Industry" 1996

Conference Board: 1996 Antitrust Conference
"How Economics Influences Antitrust and Vice Versa" 1996

Antitrust 1996: A Special Briefing
"Joint Ventures and Strategic Alliances" 1996

New York State Bar Association Section of Antitrust Law Winter Meeting
"Commentary on Horizontal Effects Issues" 1996

FTC Hearings on the Changing Nature of Competition in a Global and Innovation-Driven Age
"Vertical Issues for Networks and Standards" 1995

Wharton Seminar on Applied Microeconomics
"Access Policies with Imperfect Regulation" 1995

Antitrust 1996, Washington D.C.
"Assessing Joint Ventures for Diminution of Competition" 1995

ABA Annual Meeting, Section of Antitrust Law
"Refusals to Deal – Economic Tests for Competitive Harm" 1995

FTC Seminar on Antitrust Enforcement Analysis
"Diagnosing Collusion Possibilities" 1995

Philadelphia Bar Education Center: Antitrust Fundamentals
"Antitrust – The Underlying Economics" 1995

Vanderbilt University Conference on Financial Markets
"Why Do Christie and Schultz Infer Collusion From Their Data?" 1995

ABA Section of Antitrust Law Chair's Showcase Program
"Discussion of Telecommunications Competition Policy" 1995

Conference Board: 1995 Antitrust Conference
"Analysis of Mergers and Joint Ventures" 1995

ABA Conference on The New Antitrust: Policy of the '90s
"Antitrust on the Super Highways/Super Airways" 1994

ITC Hearings on The Economic Effects of Outstanding Title VII Orders
"The Economic Impacts of Antidumping Policies" 1994

OECD Working Conference on Trade and Competition Policy
"Empirical Evidence on The Nature of Anti-dumping Actions" 1994

Antitrust 1995, Washington D.C.
"Rigorous Antitrust Standards for Distribution Arrangements" 1994

ABA – Georgetown Law Center: Post-Chicago Economics: New Theories – New Cases?
"Economic Foundations for Vertical Merger Guidelines" 1994

Conference Board: Antitrust Issues in Today's Economy
"New Democrats, Old Agencies: Competition Law and Policy" 1994

Federal Reserve Board Distinguished Economist Series
"Regulated Private Enterprise Versus Public Enterprise" 1994

Institut d'Etudes Politiques de Paris
"Lectures on Competition Policy and Privatization" 1993

Canadian Bureau of Competition Policy Academic Seminar Series, Toronto
"Public Versus Regulated Private Enterprise" 1993

CEPS Symposium on The Clinton Administration: A Preliminary Report Card
"Policy Towards Business" 1993

Columbia Institute for Tele-Information Conference on Competition in Network Industries, New York, NY
"Discussion of Deregulation of Networks: What Has Worked and What Hasn't" 1993

World Bank Annual Conference on Development Economics
"Public Versus Regulated Private Enterprise" 1993

Center for Public Utilities Conference on Current Issues Challenging the Regulatory Process, Santa Fe, NM
"The Economics of Current Issues in Telecommunications Regulation" 1992
"The Role of Markets in Presently Regulated Industries" 1992

The Conference Board's Conference on Antitrust Issues in Today's Economy, New York, NY
"Antitrust in the Global Economy" 1992
"Monopoly Issues for the '90s" 1993

Columbia University Seminar on Applied Economic Theory, New York, NY
"Economic Rationales for the Scope of Privatization" 1992

Howrey & Simon Conference on Antitrust Developments, Washington, DC
"Competitive Effects of Concern in the Merger Guidelines" 1992

Arnold & Porter Colloquium on Merger Enforcement, Washington, DC
"The Economic Foundations of the Merger Guidelines" 1992

American Bar Association, Section on Antitrust Law Leadership Council Conference, Monterey, CA
"Applying the 1992 Merger Guidelines" 1992

OECD Competition Policy Meeting, Paris, France
"The Economic Impacts of Antidumping Policy" 1992

Center for Public Choice Lecture Series, George Mason University Arlington, VA
"The Economic Impacts of Antidumping Policy" 1992

Brookings Institution Microeconomics Panel, Washington, DC,
"Discussion of the Evolution of Industry Structure" 1992

AT&T Conference on Antitrust Essentials
"Antitrust Standards for Mergers and Joint Ventures" 1991

ABA Institute on The Cutting Edge of Antitrust: Market Power
"Assessing and Proving Market Power: Barriers to Entry" 1991

Second Annual Workshop of the Competition Law and Policy Institute of New Zealand
"Merger Analysis, Industrial Organization Theory, and Merger Guidelines" 1991
"Exclusive Dealing and the *Fisher & Paykel* Case" 1991

Special Seminar of the New Zealand Treasury
"Strategic Behavior, Antitrust, and The Regulation of Natural Monopoly" 1991

Public Seminar of the Australian Trade Practices Commission
"Antitrust Issues of the 1990's" 1991

National Association of Attorneys General Antitrust Seminar
"Antitrust Economics" 1991

District of Columbia Bar's 1991 Annual Convention
"Administrative and Judicial Trends in Federal Antitrust Enforcement" 1991

ABA Spring Meeting
"Antitrust Lessons From the Airline Industry" 1991

Conference on The Transition to a Market Economy – Institutional Aspects
"Anti-Monopoly Policies and Institutions" 1991

Conference Board's Thirtieth Antitrust Conference
"Antitrust Issues in Today's Economy" 1991

American Association for the Advancement of Science Annual Meeting
"Methodologies for Economic Analysis of Mergers" 1991

General Seminar, Johns Hopkins University
"Economic Rationales for the Scope of Privatization" 1991

Capitol Economics Speakers Series
"Economics of Merger Guidelines" 1991

CRA Conference on Antitrust Issues in Regulated Industries
"Enforcement Priorities and Economic Principles" 1990

Pepper Hamilton & Scheetz Anniversary Colloquium
"New Developments in Antitrust Economics" 1990

PLI Program on Federal Antitrust Enforcement in the 90's
"The Antitrust Agenda of the 90's" 1990

FTC Distinguished Speakers Seminar
"The Evolving Merger Guidelines" 1990

The World Bank Speakers Series
"The Role of Antitrust Policy in an Open Economy" 1990

Seminar of the Secretary of Commerce and Industrial Development of Mexico
"Transitions to a Market Economy" 1990

Southern Economics Association
"Entry in Antitrust Analysis of Mergers" 1990
"Discussion of Strategic Investment and Timing of Entry" 1990

American Enterprise Institute Conference on Policy Approaches to the Deregulation of Network Industries
"Discussion of Network Problems and Solutions" 1990

American Enterprise Institute Conference on Innovation, Intellectual Property, and World Competition
"Law and Economics Framework for Analysis" 1990

Banco Nacional de Desenvolvimento Economico Social Lecture
"Competition Policy: Harnessing Private Interests for the Public Interest" 1990

Western Economics Association Annual Meetings
"New Directions in Antitrust from a New Administration" 1990
"New Directions in Merger Enforcement: The View from Washington" 1990

Woodrow Wilson School Alumni Colloquium
"Microeconomic Policy Analysis and Antitrust – Washington 1990" 1990

Arnold & Porter Lecture Series
"Advocating Competition" 1991
"Antitrust Enforcement" 1990

ABA Antitrust Section Convention
"Recent Developments in Market Definition and Merger Analysis" 1990

Federal Bar Association
"Joint Production Legislation: Competitive Necessity or Cartel Shield?" 1990

Pew Charitable Trusts Conference
"Economics and National Security" 1990

ABA Antitrust Section Midwinter Council Meeting
"Fine-tuning the Merger Guidelines" 1990
"The State of the Antitrust Division" 1991

International Telecommunications Society Conference
"Discussion of the Impact of Telecommunications in the UK" 1989

The Economists of New Jersey Conference
"Recent Perspectives on Regulation" 1989

Conference on Current Issues Challenging the Regulatory Process
"Innovative Pricing and Regulatory Reform" 1989
"Competitive Wheeling" 1989

Conference Board: Antitrust Issues in Today's Economy
"Foreign Trade Issues and Antitrust" 1989

McKinsey & Co. Mini-MBA Conference
"Economic Analysis of Pricing, Costing, and Strategic Business Behavior" 1989
1994

Olin Conference on Regulatory Mechanism Design
"Revolutions in Regulatory Theory and Practice: Exploring The Gap" 1989

University of Dundee Conference on Industrial Organization and Strategic Behavior
"Mergers in Differentiated Product Industries" 1988

Leif Johanson Lectures at the University of Oslo
"Normative Issues in Industrial Organization" 1988

Mergers and Competitiveness: Spain Facing the EEC
"Merger Policy" 1988
"R&D Joint Ventures" 1988

New Dimensions in Pricing Electricity
"Competitive Pricing and Regulatory Reform" 1988

Program for Integrating Economics and National Security: Second Annual Colloquium
"Arming Decisions Under Asymmetric Information" 1988

European Association for Research in Industrial Economics
"U.S. Railroad Deregulation and the Public Interest" 1987
"Economic Rationales for the Scope of Privatization" 1989
"Discussion of Licensing of Innovations" 1990

Annenberg Conference on Rate of Return Regulation in the Presence of Rapid Technical Change
"Discussion of Regulatory Mechanism Design in the Presence of Research, Innovation, and Spillover Effects" 1987

Special Brookings Papers Meeting
"Discussion of Empirical Approaches to Strategic Behavior" 1987
"New Merger Guidelines" 1990

Deregulation or Regulation for Telecommunications in the 1990's
"How Effective are State and Federal Regulations?" 1987

Conference Board Roundtable on Antitrust
"Research and Production Joint Ventures" 1990
"Intellectual Property and Antitrust" 1987

Current Issues in Telephone Regulation
"Economic Approaches to Market Dominance: Applicability of Contestable Markets" 1987

Harvard Business School Forum on Telecommunications
"Regulation of Information Services" 1987

The Fowler Challenge: Deregulation and Competition in The Local Telecommunications Market
"Why Reinvent the Wheel?" 1986

World Bank Seminar on Frontiers of Economics
"What Every Economist Should Know About Contestable Markets" 1986

Bell Communications Research Conference on Regulation and Information
"Fuzzy Regulatory Rules" 1986

Karl Eller Center Forum on Telecommunications
"The Changing Economic Environment in Telecommunications: Technological Change and Deregulation" 1986

Railroad Accounting Principles Board Colloquium
"Contestable Market Theory and ICC Regulation" 1986

Canadian Embassy Conference on Current Issues in Canadian-U.S. Trade and Investment
"Regulatory Revolution in the Infrastructure Industries" 1985

Eagleton Institute Conference on Telecommunications in Transition
"Industry in Transition: Economic and Public Policy Overview" 1985

Brown University Citicorp Lecture
"Logic of Regulation and Deregulation" 1985

Columbia University Communications Research Forum
"Long Distance Competition Policy" 1985

American Enterprise Institute Public Policy Week
"The Political Economy of Regulatory Reform" 1984

MIT Communications Forum
"Deregulation of AT&T Communications" 1984

Bureau of Census Longitudinal Establishment Data File and Diversification Study Conference
"Potential Uses of The File" 1984

Federal Bar Association Symposium on Joint Ventures
"The Economics of Joint Venture Assessment" 1984

Hoover Institute Conference on Antitrust
"Antitrust for High-Technology Industries" 1984

NSF Workshop on Predation and Industrial Targeting
"Current Economic Analysis of Predatory Practices" 1983

The Institute for Study of Regulation Symposium: Pricing Electric, Gas, and Telecommunications Services Today and for the Future
"Contestability As A Guide for Regulation and Deregulation" 1984

University of Pennsylvania Economics Day Symposium
"Contestability and Competition: Guides for Regulation and Deregulation" 1984

Pinhas Sapir Conference on Economic Policy in Theory and Practice
"Corporate Governance and Market Structure" 1984

Centre of Planning and Economic Research of Greece
"Issues About Industrial Deregulation" 1984
"Contestability: New Research Agenda" 1984

Hebrew and Tel Aviv Universities Conference on Public Economics
"Social Welfare Dominance Extended and Applied to Excise Taxation" 1983

NBER Conference on Industrial Organization and International Trade
"Perspectives on Horizontal Mergers in World Markets" 1983

Workshop on Local Access: Strategies for Public Policy
"Market Structure and Government Intervention in Access Markets" 1982

NBER Conference on Strategic Behavior and International Trade
"Industrial Strategy with Committed Firms: Discussion" 1982

Columbia University Graduate School of Business, Conference on Regulation and New Telecommunication Networks
"Local Pricing in a Competitive Environment" 1982

International Economic Association Roundtable Conference on New Developments in the Theory of Market Structure
"Theory of Contestability" 1982
"Product Dev., Investment, and the Evolution of Market Structures" 1982

N.Y.U. Conference on Competition and World Markets: Law and Economics
"Competition and Trade Policy – International Predation" 1982

CNRS-ISPE-NBER Conference on the Taxation of Capital
"Welfare Effects of Investment Under Imperfect Competition" 1982

Internationales Institut fur Management und Verwalturg Regulation Conference
"Welfare, Regulatory Boundaries, and the Sustainability of Oligopolies" 1981

NBER-Kellogg Graduate School of Management Conference on the Econometrics of Market Models with Imperfect Competition
"Discussion of Measurement of Monopoly Behavior: An Application to the Cigarette Industry" 1981

The Peterkin Lecture at Rice University
"Deregulation: Ideology or Logic?" 1981

FTC Seminar on Antitrust Analysis
"Viewpoints on Horizontal Mergers" 1982
"Predation as a Tactical Inducement for Exit" 1980

NBER Conference on Industrial Organization and Public Policy
"An Economic Definition of Predation" 1980

The Center for Advanced Studies in Managerial Economics Conference on The Economics of Telecommunication
"Pricing Local Service as an Input" 1980

Aspen Institute Conference on the Future of the Postal Service
"Welfare Economics of Postal Pricing" 1979

Department of Justice Antitrust Seminar
"The Industry Performance Gradient Index" 1979

Eastern Economic Association Convention
"The Social Performance of Deregulated Markets for Telecom Services" 1979

Industry Workshop Association Convention
"Customer Equity and Local Measured Service" 1979

Symposium on Ratemaking Problems of Regulated Industries
"Pricing Decisions and the Regulatory Process" 1979

Woodrow Wilson School Alumni Conference
"The Push for Deregulation" 1979

NBER Conference on Industrial Organization
"Intertemporal Sustainability" 1979

World Congress of the Econometric Society
"Theoretical Industrial Organization" 1980

Institute of Public Utilities Conference on Current Issues in Public Utilities Regulation
"Network Access Pricing" 1978

ALI-ABA Conference on the Economics of Antitrust
"Predatoriness and Discriminatory Pricing" 1978

AEI Conference on Postal Service Issues
"What Can Markets Control?" 1978

University of Virginia Conference on the Economics of Regulation
"Public Interest Pricing" 1978

DRI Utility Conference
"Marginal Cost Pricing in the Utility Industry: Impact and Analysis" 1978

International Meeting of the Institute of Management Sciences
"The Envelope Theorem" 1977

University of Warwick Workshop on Oligopoly
"Industry Performance Gradient Indexes" 1977

North American Econometric Society Convention
"Intertemporal Sustainability" 1979
"Social Welfare Dominance" 1978
"Economies of Scope, DAIC, and Markets with Joint Production" 1977

Telecommunications Policy Research Conference
"Transition to Competitive Markets" 1986
"InterLATA Capacity Growth, Capped NTS Charges and Long Distance Competition" 1985
"Market Power in The Telecommunications Industry" 1984
"FCC Policy on Local Access Pricing" 1983
"Do We Need a Regulatory Safety Net in Telecommunications?" 1982
"Anticompetitive Vertical Conduct" 1981
"Electronic Mail and Postal Pricing" 1980
"Monopoly, Competition and Efficiency": Chairman 1979
"A Common Carrier Research Agenda" 1978
"Empirical Views of Ramsey Optimal Telephone Pricing" 1977
"Recent Research on Regulated Market Structure" 1976
"Some General Equilibrium Views of Optimal Pricing" 1975

National Bureau of Economic Research Conference on Theoretical Industrial Organization
"Compensating Variation as a Measure of Welfare Change" 1976

Conference on Pricing in Regulated Industries: Theory & Application
"Ramsey Optimal Pricing of Long Distance Telephone Services" 1977

NBER Conference on Public Regulation
"Income Distributional Concerns in Regulatory Policy-Making" 1977

Allied Social Science Associations National Convention
"Merger Guidelines and Economic Theory" 1990
Discussion of "Competitive Rules for Joint Ventures" 1989
"New Schools in Industrial Organization" 1988
"Industry Economic Analysis in the Legal Arena" 1987
"Transportation Deregulation" 1984
Discussion of "Pricing and Costing of Telecommunications Services" 1983
Discussion of "An Exact Welfare Measure" 1982
"Optimal Deregulation of Telephone Services" 1982
"Sector Differentiated Capital Taxes" 1981
"Economies of Scope" 1980
"Social Welfare Dominance" 1980
"The Economic Definition of Predation" 1979
Discussion of "Lifeline Rates, Succor or Snare?" 1979
"Multiproduct Technology and Market Structure" 1978
"The Economic Gradient Method" 1978
"Methods for Public Interest Pricing" 1977
Discussion of "The Welfare Implications of New Financial Instruments" 1976
"Welfare Theory of Concentration Indices" 1976
Discussion of "Developments in Monopolistic Competition Theory" 1976
"Hedonic Price Adjustments" 1975
"Public Good Attributes of Information and its Optimal Pricing" 1975
"Risk Invariance and Ordinally Additive Utility Functions" 1974
"Consumer's Surplus: A Rigorous Cookbook" 1974

University of Chicago Symposium on the Economics of Regulated Public Utilities
"Optimal Prices for Public Purposes" 1976

American Society for Information Science
"The Social Value of Information: An Economist's View" 1975

Institute for Mathematical Studies in the Social Sciences Summer Seminar
"The Sustainability of Natural Monopoly" 1975

U.S.-U.S.S.R. Symposium on Estimating Costs and Benefits of Information Services
"The Evaluation of the Economic Benefits of Productive Information" 1975

NYU-Columbia Symposium on Regulated Industries
"Ramsey Optimal Public Utility Pricing" 1975

Research Seminars:

Bell Communications Research (2)
Bell Laboratories (numerous)
Department of Justice (3)
Electric Power Research Institute
Federal Reserve Board
Federal Trade Commission (4)
Mathematica
Rand
World Bank (3)
Carleton University
Carnegie-Mellon University
Columbia University (4)
Cornell University (2)
Georgetown University
Harvard University (2)
Hebrew University
Johns Hopkins University (2)
M. I. T. (4)
New York University (4)
Northwestern University (2)
Norwegian School of Economics and Business Administration
University of California, San Diego
University of Chicago
University of Delaware
University of Florida
University of Illinois
University of Iowa (2)
Universite Laval

University of Maryland
University of Michigan
University of Minnesota
University of Oslo
University of Pennsylvania (3)
University of Toronto
University of Virginia
University of Wisconsin
University of Wyoming
Vanderbilt University
Yale University (2)
Princeton University (many)
Rice University
Stanford University (5)
S.U.N.Y. Albany